



FRIDAY, MARCH 18, 1881.

Machine for Grinding Locomotive Slide-bars.

The use of emery grinding machines in almost every branch of accurate machine construction is extending every year. Wherever exact cylindrical forms or true plane metal surfaces are required, emery wheels have been found to be the most effective means of supplementing the work of the lathe and planing machine in producing exact work. Sir Joseph Whitworth was among the first to develop the true surface-plate system, which he arrived at by scraping the surfaces and correcting the errors and inequalities by fitting the plates to each other. Two plates may be made to fit each other perfectly and neither be a true plane, because one may be convex and the other concave to correspond, but if one plate is fitted to two others and the latter are both convex or concave, they will not fit each other. Latterly, however, true surfaces are reproduced by moving an object on a perfectly true plane or table over a grinding wheel in the middle which removes all the projections of the object, and in this way the perfect plane of the table is, as it were, transferred to the object.

The machine illustrated herewith is intended to produce perfectly true wearing surfaces on locomotive slide-bars in this way. The engraving illustrates its construction so clearly that little or no description is needed. The distance from the floor to the centre of the spindle is 27 in. The latter is of steel, two inches in diameter, and two or three cone pulleys are furnished, as may be required. The machine is intended for emery wheels of 20 in. diameter and 4 in. face, which it will wear down to 9 in. in diameter. The plate for the surface grinding is 5 ft. long and 11 in. wide, and can be raised and lowered.

The Rogers and the Danforth Locomotive Works at Paterson each have one, and the Erie Railroad shop at Susquehanna has two of these machines, and the manufacturers say they have reason to think they are giving good satisfaction.

The price of them is \$250 each, which includes first-class over-head work, but does not include emery wheels. The name and the address of the manufacturer is given with the engraving.

Contributions.**Bowstring Bridges in Streets.**

TO THE EDITOR OF THE RAILROAD GAZETTE:

I hope you will give us plans and full details of the bad bowstring bridge which fell at Groveland, Mass., a short time ago, as you did of the good and beautiful Calvert street bowstring bridge, lately built at Baltimore. Engineers are as much interested in structures which fall as in those which stand.

I am convinced that a bowstring bridge is the very worst possible type to build in or near towns and cities, although, perhaps, the best for highways in the country.

When a procession, or something extraordinary, is to be seen passing near, or perhaps over, the bridge, not only the bridge floor itself, but the arches are packed with people. The arches being flat on top, from one to two feet wide, and extending down to the floor, present an easy walk up, and a pleasant place to sit and see the sight. I have known of the three arches of a double roadway bridge to be literally packed with people, which at a distance looked like beads on a wire, at the same time that the floor and sidewalks were from one-half to two-thirds covered with spectators, besides a procession moving across.

When it is considered that the middle arch is generally wide enough for two persons to sit, back to back, and that it is possible on a 100-ft. span to place 140 people on the middle bow alone, and 70 each on the other two (presuming the bridge to have three trusses), giving a total of 280 persons on the arches alone, besides the number on the floor, the weight of the bridge itself, with a heavy load of snow and ice, perhaps, it becomes a very serious matter, and one seldom or never taken into account—as far as the arch load is concerned—when calculating the strains.

In my opinion, therefore, bowstring bridges, to be entirely safe when liable to be loaded in the manner mentioned, cannot be economical; and if not entirely safe, then they should not be permitted in or near towns or cities.

Town authorities would do well to place special policemen, when necessary, and prevent persons from crowding on any street bridge, but more particularly on a bowstring, where the arches afford the best positions for sightseeing. C. E.

Recent Railroad Progress.

The following very interesting summary of recent progress in the art of railroading has been contributed by Mr.

Charles Paine, General Superintendent of the Lake Shore & Michigan Southern Railway, to the Cleveland Engineers' Club of which he is President:

GENTLEMEN.—Your committee on programme has kindly relieved me from the implied obligation, contained in the constitution of this club, to prepare an annual address, and has assigned to me the lesser duty of reporting to you such new features as have distinguished railway engineering and practice during the past few years. In order to give time for the more interesting topics entrusted to the gentlemen who are to follow me, I shall be brief. You will realize how little there is which can be new to members, when you reflect upon the fact that every newspaper contains a column devoted to railroad news.

EXCESSIVE RAILROAD CONSTRUCTION.

You already know that we built in the United States last year more than 7,300 miles of railway, bringing the aggregate up to about 93,000 miles. The so-called capitalists, who print and issue beautiful lithographic bonds and certificates of stocks on account of the new railroads, which they have contracted to have built by the mile, before the surveys are made, now promise to add to this aggregate a larger number of miles of cheap railways this year than in any other year since railways began; and so to hasten the coming of the usual collapse after a shorter interval of prosperity, as we call it, than we have generally enjoyed. If any one can remember three years ago, he will recollect that he had then very grave doubts whether any of the oldest and best railways would ever pay another dividend; yet the capitalist does not now hesitate to invest the money of other people in lines alongside of these precarious properties. So much it is necessary to say as to our progress toward the abyss of bankruptcy, which lies at the end of the grade down which we are rushing with all steam on.

Other aspects are more encouraging. Useful and valuable roads are being undertaken in the outlying countries of the globe in all directions. The territories of the United

railways which should be mentioned is the increase which has taken place within a short time in the car-load, due almost entirely to engineering improvements in the construction of tracks; better rails, better joints, better drainage combining to allow one-half more load in the car than it formerly carried. By an increase in the size of the axles and springs, this load has been made double what it was six or seven years ago for the standard freight car. The load per train has been otherwise increased by an addition to the power of the freight locomotive. The so-called *American locomotive*, with four drivers, has been superseded by the Mogul, and that by the Consolidation engine, with eight drivers, for freight traffic; European experience having developed a similar effort to make use of so much of the adhesion of the locomotive to the rails as can be availed of consistently with mechanical limitations. The cost per ton hauled depends most upon the number of tons taken per train; the cost per train being in comparison but little affected by its size.

STEEL RAILS.

I have already referred to the improvements in track, of which the general substitution of steel rails for iron has been the most important. Certainly, if it had not been for Mr. Bessemer's discoveries and inventions, the present railway and its traffic would have been impossible. And, although Mr. Bessemer gave us steel rails, he could not tell us, nor could any one until experience had been had, how to make the best steel rails. The liberal and scientific minds, which conduct the Pennsylvania Railroad have, through their experts, given us a nearer solution of this most important problem than we have ever had, and they have lately nearly demonstrated the correctness of their conclusions. I refer you to Dr. Charles B. Dudley's paper on "The Wearing Power of Steel Rails, in Relation to their Chemical Composition and Physical Properties," reprinted in the *Railroad Gazette*, Feb. 11, 1881, and in the *American Engineer* as a model of what an engineer's paper should be, and also as the most important contribution to our knowledge of the chemical structure of the rails which has yet been made.

CROSS-TIES.

Not long ago much anxiety was felt as to a supply of timber for ties being obtainable. The cause for anxiety has been removed in three ways: First, by a demonstration that we can prolong the life of our perishable timbers by creosoting and other processes, so as to make them available (an excellently well designed apparatus on wheels, which has been used in France for this purpose, lately appeared in *Engineering*); second, by showing that we can grow the ties of durable timber, rapidly enough, on waste lands, whenever we will arrange to do so; and thirdly, by the showing already made in Germany and in England that a track with iron sleepers is probably better and more durable than any other. Some trifling improvements in fastenings of the rails to the sleepers, which the celebrated Yankee baby is now pondering in his cradle, are all that seems necessary to make the iron way a permanent way indeed. The mileage of cast-iron wheels has been increased—it has about doubled—on the average during the past eight years, although the load upon the wheels has increased also. Responsible makers now guarantee the wheels under passenger cars and locomotives to run at least 60,000 miles. The metre-gauge, adopted for the government railways in India, appears at last accounts to have been abandoned, the main line now in construction being made of uniform gauge with the older lines.

LOCOMOTIVE IMPROVEMENT.

Attempts at improving the locomotive in other ways than I have mentioned are not wanting. The principle of the compound engine has been experimented with, one cylinder using the steam at its highest pressure and passing it over to a larger one to be used to its extremest expansion. The arrangement has been found economical of fuel, but its use upon fast trains or heavy trains has not been shown to be practicable. In a locomotive we must have the most rapid and efficient development of power, at whatever cost. We cannot wait to save fuel, if we can go faster by burning more of it. Mr. Wooten has had the courage to make his fire-box big enough to burn poor fuel, or good fuel somewhat more slowly, and an economy is hoped for by this means. I cannot yet say that it is assured. Mr. Fontaine has attempted a high-speed locomotive by mounting one pair of drivers over the other pair to propel them by friction; he can doubtless run fast without a load; to draw a load he must have adhesion; to have enough adhesion he must concentrate the load carried by the four drivers of ordinary locomotives upon his two, which is fatal to his scheme, as I believe.

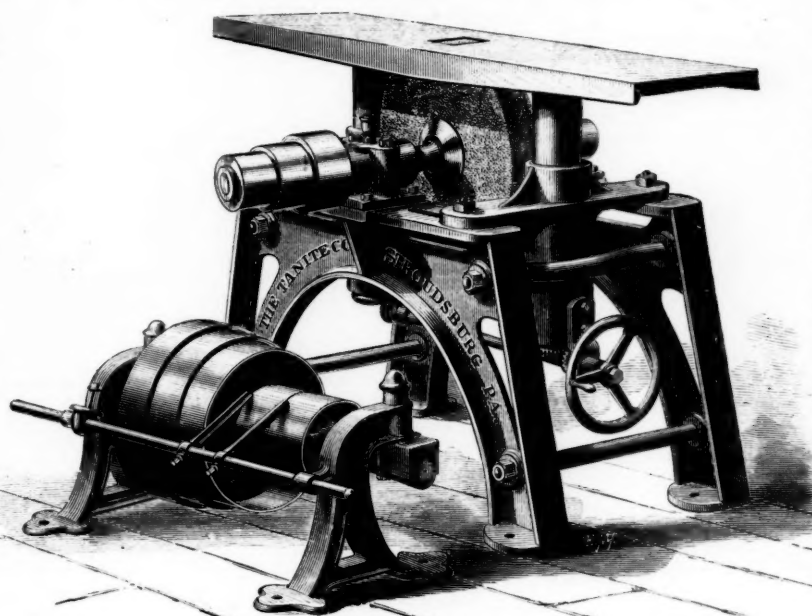
A brave man in Europe, Mr. Verderber, has made the fire-box of his locomotive of firebrick, surrendering the use of the end and sides of the fire-box as heating surfaces; yet contrary to the predictions of his comrades he has obtained about as rapid generation of steam from a given quantity of fuel as with the ordinary fire-box. Whether he will attain any economy or other advantage, is not yet shown; but the result which I have mentioned is likely to have a great effect upon boiler construction in the future.

SIGNALING

has been much improved here and abroad. The interlocking of switches and signals is coming more and more into use on busy lines. A hydraulic system of interlocking and operating the switches has lately been introduced, from which I anticipate the most excellent results, judging by the success which has attended all previous uses of hydraulic power. The block system, insuring a positive space between trains, is gaining new friends with every rear collision. The telephone is the greatest convenience ever introduced into the large freight yards.

An electric railway has been put into service at Berlin, with promise of some success for light trains; and with the rapid development in the art of producing electricity we may hope for an important addition to our means of transportation in cities, from its employment. I have not been able to find a description of this railway sufficient to give clear ideas of it, although I think one has appeared in *Engineering*.

In looking over some statistics of mileage, it impressed me as a fact indicating a creditable advance in the railroad art that a single postal car running between New York and Chicago had made trips amounting to 482 miles per day, continuously for two years, or a little more than twenty miles per hour during the whole of that period. Other cars



MACHINE FOR GRINDING LOCOMOTIVE SLIDE-BARS.

Made by the Tanite Company, Stroudsburg, Pa.

States, Mexico, Brazil, Japan, Siberia, Australia, Africa, are all to be opened shortly to the beneficent influences of commerce by means of the railroads already projected and in progress.

THE GOOD EFFECTS OF RAILROAD CO-OPERATION.

The most important recent change which has affected the railroad interests of the United States is the substitution of the principle of combination for that of competition, in the conduct of their business. Under the wise lead of Mr. A. Fink, a distinguished engineer, the uncertainty of rates, which was so disastrous to shipper, consignee and railroad company, has been replaced by steadiness in rates and certainty of remunerative returns, without a discoverable increase in the cost of transportation, affecting the expenditures of any living person. This certainty of remuneration has emboldened the owners of railway properties to invest largely in the improvement of their roads and their equipment; improvements absolutely necessary to the prosperity of the communities in which they are operated. For although the manufacturer's freight is a valuable contribution to the revenues of the railway, what will he or his customers do if they cannot get cars to move it?

Perhaps the most important economical question of the present season, in the United States, has been whether or not the necessary additional equipment of cars and engines could or would be provided. The answer would affect every interest of the nation. For seven years the owners of railways dared not invest another dollar in addition to the capital already embarked, for there was no promise of profit or interest. At the end of this period, reviving commerce, manufactures and agriculture found they had outgrown the facilities of transportation, which, during the term of depression, had been largely in excess of the business to be done, and they called upon the railway owners to get ready for the enormous trade they and their customers were now anxious to have developed and transacted. Suppose, then, that pooling, or combination between the trunk lines, had not been effected; that no hope of dividends nor of steady rates could have been entertained by those upon whom the internal commerce of the country depends for the capital to provide it with wheels and to keep them in motion; can any one sufficiently describe the injuries which must have ensued, the delay and hindrance to new enterprises, and the resulting effect upon the earnings and profits of every individual in the community? Under the benign influence of restored dividends, capital has flowed in a free stream into these channels of investment, which had been so long dry; yet those who are familiar with the demand for transportation know how far from filling the want this great expenditure has been.

LARGER CAR-LOADS.

Among the notable improvements in the operating of

had done a little more than this in the last year; but this one had followed it up for two years, and is still going.

It is gratifying to be able to report some improvement in legislation concerning railways. The better sense of the people has triumphed over the granger foolishness, and admits that it is safer to have the roads prosperous, so that they can be maintained in good condition, rather than to have them starved into an economy which will compel them to neglect the renewals upon which safety depends. In several of the states, the railway commissioners have been of great service in bringing about this return to reason; acting, as they have, in a judicial capacity, and deciding justly between the clamors of popular prejudices on the one hand and the partial views of railroad managers on the other. Yet the tendency of railway legislation continues towards the impracticable; attempting to fix invariable tariffs of rates (affecting the commerce of a whole continent), rather than to the perfection of the laws, which will contribute to speed, safety and comfort at home; an object of much more importance to the community and within easier reach of the understanding of those who are called to make our laws. I believe a commission of ordinary legislators appointed to inquire what could be done to improve matters in this respect would evolve considerable improvements, especially if they were to ask for suggestions from persons familiar with the subject. Consider that the thousands who ride on trains through the state of Ohio are without protection from being upset at forks and any highway crossing, or private crossing, by the herds of any honest or dishonest agriculturist, who chooses to let his animals stray on to the railroad track! In a civilized country like France, for instance, it is a penal offense to have allowed an animal to get upon the railroad, and whether the railway fences are in good order or not, the innocent passengers upon the trains are not to be imperilled by the neglect of the railway or of the owner of the animal. Whoever owns an animal in that country must see to it that they cannot cause injury to others. But an animal is a slight obstruction on the track in Ohio; more dangerous objects like a saw-log, a safe, a house or barn are frequently discovered by the locomotive engineer directly in his path. The Supreme Court of Indiana decided in a well-known case that under the laws of that state a drove of mules had the same right to the crossing that the locomotive of the express train had.

Let me give another illustration of the need of the most obvious legislation. On one railroad with which I am acquainted about 100 persons are run over every year, for the reason that they prefer to walk upon the track rather than upon the highway. It is not in the power of the railroad company to protect these persons; they are a source of danger, annoyance and expense to the railroad; but it has no remedy—yet a remedy is in the hands of the Legislature.

Again, if you were to be asked, as a body of engineers, to make the most complete arrangements possible for the production of railroad accidents, would you not require all railroads to cross each other at grade? That is in substance the law of Ohio, and of most of the Western states. It is not conditioned upon the difficulty or expense or impossibility of making an over or under crossing only upon the will of the projected line as to where it shall cross another; and in several instances, which have been reported to me, the crossings so chosen were at places which involved great danger and injury to the older road, and could have been made over or under by the proper location of the new line.

It has seemed to me appropriate, after reciting the improvements which have been effected in the art of railroading, to point out the most important defect of the railroad system of America. Mechanically, economically and in administration our roads are well abreast of the railways of other countries, so far as one may judge from the technical journals; but we suffer from a neglect of fostering legislation, and from the omission by our legislators to provide for the safety of those who travel upon the railroads. The aim here has been to limit the powers of the corporations; that is well enough, they should be limited to the complete and perfect execution of the duties for which the corporations were created; but it ought to be now perceived of what importance to the community this new instrument of commerce and of circulation has become; that every individual is interested to have the promptest, safest, and most rapid movement of trains which is possible; and to that end the study of those who make the laws should also be directed. Without this, American railroading must continue as it has been heretofore, unsafe from causes beyond the control of those who operate the roads.

Locomotive Trial on the Missouri Pacific Railway.

The following is an official report made by Mr. John Hewitt, Superintendent of Motive Power and Machinery of the Missouri Pacific Railway to the General Superintendent of the road:

ST. LOUIS, Nov. 16, 1880.

A. A. Talmage, Esq., Genl. Supt.:
DEAR SIR.—In compliance with your instructions the writer, accompanied by J. H. Congdon, Esq., Master Mechanic Union Pacific Railway, went to Kansas City to test the hauling power of the consolidation locomotives owned by this company. We found engine No. 108 assigned to train No. 38, which consisted of 31 box freight cars and caboose, all of which were drawn over the track scales at State Line and found to weigh 643 tons of 2,000 lbs.

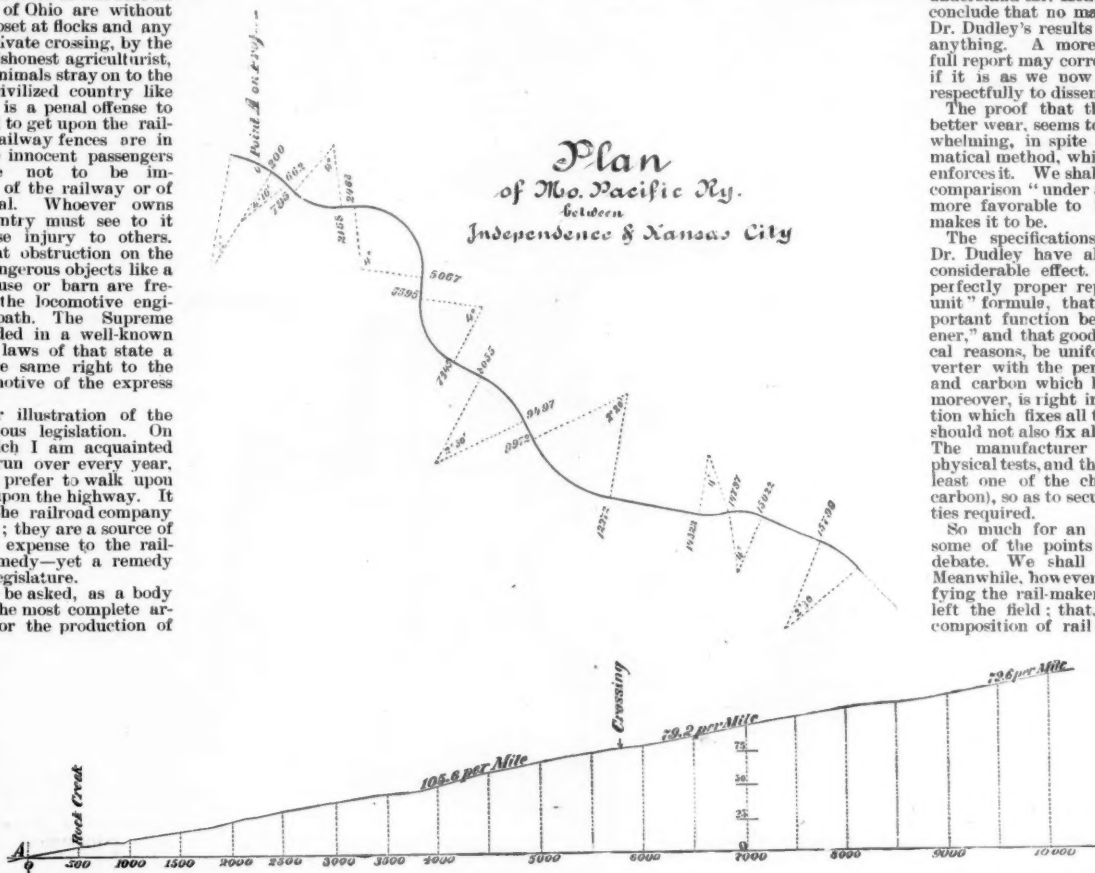
The track between Rock Creek and Independence stations was selected for the test because it contained the maximum grade and curve going east on that division. Three miles of this grade averages 60 ft. per mile and is interspersed with undulations, making frequent grades of 72 to 79 ft. and one of 105 ft. per mile for a distance of 500 ft.; all of this 105 foot grade is on a curve of 4 degrees. See profile and map herewith.

When on this grade and curve, and running about four miles per hour, steam at 140 lbs. per square inch, reversing lever in notch to cut off steam at 12 in. of stroke of piston, one

of the couplings broke, parting the train in two. After recoupling the train it was again started on the 105 ft. grade and 4 degree curve with steam at 150 lbs. per square inch, and reversing lever in forward notch. This locomotive has cylinders 22 in. diameter by 22 in. stroke, 8 driving-wheels 50 in. diameter, all connected. Weight on driving-wheels, 90,000 lbs.; weight on pony truck, 12,000 lbs. Total weight of engine and tender, with full supply of fuel and water, 160,000 lbs.

By basic calculations on the above performance it can be demonstrated that these locomotives can make schedule time on that division with the following number of cars when their weight does not exceed 40,000 lbs. each, including load, and when hauling over the grades opposite:

No. of cars.	Grade, feet per mile.	No. of cars.	Grade, feet per mile.	No. of cars.	Grade, feet per mile.
100	10	50	35	33	60
88	15	47	40	30	70
75	20	43	45	28	75
36	25	39	50	25	80
58	30	36	55	23	90
...	21	100



The above number of cars is the minimum, which can be increased 15 per cent. under favorable circumstances.

Very respectfully,
(Signed,) JOHN HEWITT, Supt. M. P. & M.

The Dudley Steel Rail Debate.

A correspondent of the *Railroad Gazette* complains of the tone of a part of the Philadelphia discussion of Dr. Dudley's paper on steel rails. He came a long distance to get wisdom, and was considerably disturbed and disgusted to hear so much laughing. He thinks "it was the aim of some of the papers written on steel rails from the producer's standpoint to detract from the usefulness of one written from that of the consumer by insinuating, and, in one case, undignified language." And he returned with the feeling that his time "had not been well spent in listening to a discussion, much of which added little or nothing to previous information, did not appear to be upon the merits of the question, and was very little to the points at issue."

We are sorry for this gentleman; but we venture to assure him that if he will wait until the full debate is published, and will then give his mind, undisturbed by the laughter of the frivolous, to the study of the various speeches and papers, he will find that, to a very remarkable extent, they were pertinent and forcible.

On the other hand, the *Iron Age* profoundly opines that the chemists received a lesson in this debate which they will not soon forget, and proceeds to urge a number of very sensible but wholly unnecessary arguments, by way of showing that, after all, the chemists should not be wholly despised.

As a matter of fact, the chemical work of Dr. Dudley was not seriously impugned at Philadelphia. Dr. Dudley's paper mentioned that certain determinations had been made by his assistants, for whose accuracy he was ready to vouch. The suggestion that these determinations should be made again, which was thrown out, not very earnestly, by one speaker, and the humorous stories told by others, of the errors that certain alleged chemists had committed, did not amount to a very severe arraignment. The comments made upon the absence of determinations of sulphur and copper in Dr. Dudley's analyses were pertinent; but we think it would not be difficult to show that they had less determining weight in the argument than their authors imagined.

Still less can it be said that chemists in general were greatly damaged. Whenever Brother Hunt or Brother Jones, or some other manager, tells one of those stories about some chemist's blunder, it is noteworthy that it is always "our chemist" who detected the thing. Every man of them believes in his own chemist; and their scorn, if they have any, is for somebody else's chemist.

In a matter of such importance, it would be perfectly proper, and not at all insulting to science, for any one who might feel inclined, to have the Altona analyses repeated. But it will not be done, simply because confidence in Dr.

Dudley's methods, and in the work done by his hand or under his eye, is universal.

Nor did he or his cause suffer any from the citation of anomalies against him. There are certain rails known to the trade, which are likely to become famous. One from Harrisburg (the coppery one), one from Troy, and so on, turn up as illustrations, to prove that nobody can prove anything. Great chunks of them are sometimes laboriously carried to institute meetings and thrown into the debates, like the chunk of new red sandstone in the Society of the Stanislaus. But they are not as weighty as they look; and against the evidence of corroborative coincidences in such great series of similar analyses as Dr. Dudley's two papers present, the testimony of these vagabond pieces of metal is idle.

It was not at all as a chemist that Dr. Dudley suffered even a shadow of defeat. In that capacity his papers reflect much glory upon him, which the conflict has not dimmed. And we predict that, whatever becomes of his deductions, the work he has done and the data he has furnished will remain of high and recognized value.

But as a mathematician, we fear the dauntless champion must confess overthrow. Several of the speakers expressed their dissatisfaction with his method of averages, though they did not seem to know very clearly what was the matter with it. Mr. Kent went further, and applied to it, graphically and otherwise, the *reductio ad absurdum*. If we understand Mr. Kent, however, he seems to conclude that no mathematical treatment of Dr. Dudley's results will make them prove anything. A more careful perusal of the full report may correct our impression; but if it is as we now suppose, we beg leave respectfully to dissent.

The proof that the softer rails give the better wear, seems to us complete and overwhelming, in spite of Dr. Dudley's mathematical method, which obscures rather than enforces it. We shall show hereafter that his comparison "under all conditions" is really more favorable to the softer rails than he makes it to be.

The specifications and tests proposed by Dr. Dudley have also been criticised with considerable effect. It is, for instance, a perfectly proper reply to his "phosphorus unit" formula, that manganese has an important function besides that of a "hardener," and that good steel can not, for physical reasons, be uniformly made in the converter with the percentages of manganese and carbon which he requires. Mr. Sellers, moreover, is right in saying that a specification which fixes all the chemical ingredients should not also fix all the physical properties. The manufacturer should be held to the physical tests, and then allowed leeway on at least one of the chemical ingredients (say carbon), so as to secure the physical properties required.

So much for an introductory survey of some of the points involved in the recent debate. We shall return to the subject. Meanwhile, however, we run no risk in notifying the rail-makers that chemistry has not left the field; that, sooner or later, the best composition of rail for given conditions will be ascertained, and that then they will have to submit. It will even be useless for them long to take refuge behind the assertion that certain percentages, not good for the rail, must be retained because they are good for the ingot. When our Bessemer manufacturers have the wit to adopt the basic process, they will find, as has been abundantly shown abroad, that by that process good ingots of any desired constitution can be made.—*Engineering and Mining Journal*.

Society of Mechanical Engineers.

The next meeting of this Society will be held in Hartford on or about May 5. Prof. Thurston and Messrs. Wolff and Bayles have signified their intention of reading papers. Other persons will probably contribute papers who have not yet announced their intention of doing so.

As we have received numerous inquiries concerning the qualifications for membership to this Society, we give below its rules referring to this subject:

MEMBERSHIP.

ART. 2. The Society shall consist of Members, Honorary Members, Associates, and Juniors.

ART. 3. Mechanical, civil, military, mining, metallurgical, and naval engineers and architects may be candidates for membership in this Society.

ART. 4. To be eligible as a Member, the candidate must have been so connected with some of the above specified professions as to be considered, in the opinion of the Council, competent to take charge of work in his department, either as a designer or constructor, or else have been connected with the same as a teacher.

ART. 5. Honorary Members, not exceeding 25 in number, may be elected. They must be persons of acknowledged professional eminence, who have virtually retired from practice.

ART. 6. To be eligible as an Associate, the candidate must have such a knowledge of, or connection with, applied science as qualifies him, in the opinion of the Council, to co-operate with engineers in the advancement of professional knowledge.

ART. 7. To be eligible as a Junior, the candidate must have been in the practice of engineering for at least two years, or he must be a graduate of an engineering school.

[The term "Junior" applies to the professional experience, and not to the age of the candidate. Juniors may become eligible to membership.]

ART. 8. All Members and Associates shall be equally entitled to the privileges of membership, provided that Honorary Members, who are not also Members or Associates, and Juniors shall not be entitled to vote, nor to be members of the Council.

ELECTION OF MEMBERS.

ART. 9. All candidates for admission to the Society, excepting candidates for honorary membership, must be proposed by at least three members, or members and associates, to whom they must be personally known, and be seconded by two others; the proposal to be accompanied by a state-

ment in writing of the grounds of their application for election, including an account of their professional service.

ART. 10. All such applications and proposals received by the Council, up to 30 days before a regular meeting, shall, at least 20 days before such regular meeting, be passed upon by the Council. The Secretary shall, at least 20 days before such regular meeting, mail to each member and associate, in the form of a letter-ballot, the names of candidates recommended by the Council for election.

ART. 12. The rejection of any candidate for admission as member, associate or junior, by seven voters shall defeat the election of said candidate. The rejection of any candidate for admission as honorary member by three voters shall defeat the election of said candidate.

ART. 14. Candidates for admission as honorary members shall not be required to present their claims; those making the nominations shall state the grounds therefor, and shall certify that the nominee will accept, if elected. The method of election in other respects shall be the same as in case of other candidates.

ART. 15. All persons elected to the Society, excepting honorary members, must subscribe to the rules and pay to the Treasurer the entrance fee and yearly dues before they can receive certificates of membership. If this is not done within six months of notification of election, the election shall be void.

ART. 16. The proposers of any rejected candidate may, within three months after such rejection, lay before the Council written evidence that an error was then made, and if a reconsideration is granted, another ballot shall be ordered.

ART. 17. The Council shall pass upon applications of juniors for membership, and shall order ballots upon such recommendations, in the manner hereinbefore described.

FEES AND DUES.

ART. 18. The initiation fee of members and associates shall be \$15, and their annual dues shall be \$10, payable in advance at the annual meeting; provided, that the persons elected at the meeting following the annual meeting shall pay \$8, and persons elected at the meeting preceding the annual meeting shall pay \$4, as dues for the current year. The initiation fee of juniors shall be \$10, and their annual dues shall be \$5, payable in advance. Any member or associate may become, by the payment of \$150 at any one time, a life member or associate, and shall not be liable thereafter to annual dues.

RAILROAD LAW.

Foreign Companies in Arkansas.

A bill has just passed the Arkansas Legislature which authorizes railroad companies of adjoining states to extend their roads into and through the state under certain conditions. The bill does away with the necessity for a separate organization in Arkansas when the company already exists in another state.

Injury to Passenger-Negligence.

In Perry against the Central Railroad & Banking Co., the Georgia Supreme Court has just held as follows:

1. It is the duty of a railroad company, through its agents, to give reasonable signals of the departure of its trains from its stations and depots. Such signals as would ordinarily attract the passengers and those interested in the movements of the cars of the railroad company.

2. Should a passenger needlessly linger about a depot or station, and neglect to board a train, then the company, as to such passenger, is only bound to ordinary diligence; and it would be the duty of such passenger to use caution in observing signals which might be given by the agents of the company.

3. The officers of a railroad company have the right to presume that passengers will only attempt to get on and off its cars at the places designated by the company for such purpose, and it is not the duty of the railroad company to keep its track clear for those who may see proper to pursue the cars while leaving a depot or station; and more especially would this be true as to those who pursue the cars to a point beyond that assigned by the company for receiving and discharging passengers.

4. A party guilty of a negligence by which a loss is sustained shall only be liable for the proximate consequences of his wrongful act.

5. To entitle a party to recover damages of a railroad company on account of the negligence of its agents, it should appear that the damages were the natural and proximate cause of the injury; for should it appear that the negligence of the railroad company would not have damaged the party complaining but for the interposition of a separate independent agency, over which the railroad company neither had or exercised control, then the party complaining cannot recover.

THE SCRAP HEAP.

Smoke.

We hear often of the protection of other people against annoyance by smokers; is it not time that somebody thought about protecting smokers from other people? As one sits on the edge of the wood-box, painfully trying to enjoy a smoke under difficulties, it is so comfortable to see at least 17 men occupying seats in the smoking car who are not smoking, haven't been smoking, don't mean to smoke, and wouldn't smoke anyhow if you asked them to.

Eighty Miles an Hour.

The fastest trains in the country now run between Jersey City and Philadelphia, and the Pennsylvania Railroad hopes soon to make a trip in an hour and a half. A monster locomotive is now building in the company's shops at Altoona which is expected to perform the feat. It will be finished in about three weeks, and if the trial trip is satisfactory, five more will be built on the same model. A locomotive capable of attaining a uniform speed of sixty miles an hour is not to be sneered at, but Colonel Roberts, of Titusville, will attempt to throw even that extraordinary performance into the shade. There is now building for him at the Baldwin Works a locomotive which is designed to be the fastest in the world. The builders and the owner will be disappointed if it doesn't make a record of 80 miles an hour, and run 100 miles without taking on coal or water. It will be taken to Europe and tested on the railroads of England and the Continent.—*New York Tribune*.

How heavy a train does Colonel Roberts expect to pull at 80 miles an hour?

Information Wanted in New Zealand.

A correspondent writes from New Zealand saying that many persons there who intend to make a trip to England prefer to take what is there known as the "overland" route—that is, by San Francisco and New York. Naturally they would like to see as much of the United States as possible on the road, and some desire to see or visit certain cities. But,

he complains, it is almost impossible there to get any information about railroad lines in this country, and many, indeed, have a vague general idea that there is but one line through from San Francisco to New York, and that no variation of routes is possible. He thinks it would be to the advantage of some of our roads if they would send out a little information in the way of circulars, descriptions of routes, maps and similar matter.

Proposals for Bolts.

Bids will be received by Major G. J. Lydecker, United States Engineers, at his office, No. 25 Honore Building, Chicago, until April 5, for furnishing about 390,000 lbs. of iron drift bolts required for cribs in the extension breakwater at Chicago. They will be of one-inch round iron, lengths varying from 16 to 32 in. Complete bill, blank forms, etc., may be had at the office in Chicago.

A New Electric Signal System.

The American Railway Signal Co. has been organized to manufacture and introduce a new system of signals devised by Mr. H. W. Spang, of Reading, Pa. The capital stock is \$500,000, and the incorporators are chiefly residents of Philadelphia. The chief features of the system are thus described by the *Reading Times and Dispatch*:

"Mr. Spang claims that none of the systems now in the market, including that of the Union Signal Co., of Boston, which is the most prominent railroad signal company now organized, fully meets the requirements of railroad companies, and there has been a hesitation and delay on the part of railroad companies to generally adopt any of the present systems, the principal objection to them being the liability of a safety signal being given through the sticking or bad working of the signal mechanism, when danger exists, thereby misleading an engineer and increasing the chances of a serious accident by collision or misplaced switch.

"By a novel and ingenious combination of a galvanic battery, electro-magnet and a closer and breaker with the rails of a railway track, Mr. Spang claims to have fully overcome the above-named objection and to fully meet the requirements and wants of railroad companies. In his system the track is divided into insulated sections, a mile or more in length, and the rails thereof are used as the principal electric conductors. At the distant end of each section of track a galvanic battery is connected with the two lines of rails, and at a safe distance ahead of the near end of each section a circuit closer and breaker and an electro-magnet, which controls a visual signal indicating danger and safety, are connected with said lines of rails.

"In his system a danger signal is always displayed until a locomotive or train approaching the section of track to be protected reaches the circuit closer or breaker, when the electro-magnet will be charged and the danger signal thereby removed from the view of the engineer and a safety signal given to him, provided the rails of the section of track to be protected are not occupied by a locomotive, train or car; a switch is not set for a siding or branch track, a rail is not removed or broken, and cars on a siding do not project too near the main track. Should the rails of the section of the track ahead be occupied by a locomotive, train, car or pair of wheels or even by a heavy iron bar, a rail removed or broken, a switch set for a siding, or a car, or cars, on siding project too near the main track, the danger signal will remain stationary, thereby indicating to the engineer that something is wrong, and that he shall proceed with caution.

"Should a safety signal be displayed before the locomotive reaches the circuit closer and breaker, it will indicate that the signal mechanism has stuck or is not working properly, thereby notifying the engineer to proceed cautiously.

Legislating on Car Construction.

A bill has been favorably reported to the Massachusetts Legislature providing that all box freight cars hereafter obtained by any railroad corporation in that state shall be provided with a iron wire railing, not less than four inches in height, running along each side of the car at the top for the protection of train hands, and any company violating the act shall forfeit not exceeding \$25.

Compressed Air Locomotive.

The *English Mechanic* says:

"A Beaumont compressed air locomotive was tried on the Metropolitan Railway last week. The engine was not large enough to draw a complete train, the wheels being only 30 in. in diameter. The inventor, Col. Beaumont, R. E., was present, together with Mr. Tomlinson, chief engineer of the line; Col. Frank Bolton, Major Ardagh, of the War Office, and several other gentlemen. A start was made from the Chapel street works of the railway company, near the Edgware road station. The engine ran to Baker street, where it was shunted on to the St. John's Wood line to pick up a carriage, then ran from Baker street to Moorgate street. On the return journey, after a halt at King's Cross, the engine ran without a stop to Edgware road, the distance between the two stations—which is for the greater part an ascent of 1 in 100—being performed in eight minutes. The total distance run, including the shunting, was about eleven miles, and the weight moved, including the engine itself, was about twenty tons. The engine commenced with an initial pressure of 1,000 pounds on the square inch, and when the run was finished the gauge showed a remaining pressure of 300 pounds in the cylinders."

German Rail Tests.

The German Railway Union has agreed upon certain prescriptions to be satisfied in the steel rails they use. The tests to be made in the works are these: A rail placed on two supports, one metre apart, must bear a load of 20 tons for several hours, without permanent flexure. In like position it must bear, without breaking, two strokes of the monkey of a pile-driver, a weight of 500 kilograms (1,100 lbs.), falling 4 metres (13 ft.), and without any injury, a fall of the monkey 2.50m. (5 ft.). The rail must be capable of being bent in the cold state either way to the extent of 50mm. (2 in.), without showing cracks or fissures. It must be capable of bearing a curvature of 22.5mm. in 3 metres of length (0.9 in. in 9 ft. 10 in.).

Attempt at Train-Wrecking.

On the evening of March 11 an attempt was made to wreck the night express on the New York, New Haven & Hartford road at Windsor Locks, Conn., by jamming an iron chair into a frog. When the train struck it the chair was thrown out and the frog broken, the only damage sustained by the train being the breaking of a wheel under the tender, which did not throw it from the track. No clue has yet been obtained to the perpetrators of the attempt.

A Volunteer Signal.

Just at a curve on the New York, New Haven & Hartford road near Westport, Conn., lives an old lady who is a believer in the virtues of red flannel and has her petticoats made of that material. Every Monday they are duly washed and hung out on the line. But it happens that her clothes-line is put up just where the red petticoat is visible up the road for some distance above the curve. Trains without number have pulled up, believing there was a red flag; railroad men innumerable, have—not sworn, for in Connecticut they

do not swear—but begged the old lady, in moving terms, to take away that signal. She, however, sturdily insisted on her right to hang up her own clothes where she pleases in her own yard, and the railroad men don't know what to do, especially as it is a bad curve and they are afraid that some day there may be a real flag there.

A Race with a Train.

A dispatch to the St. Paul *Pioneer-Press* from near New Richmond, Wis., March 3, says: "The other day, as E. M. Simonton, of this place, was about to cross the railroad near Boardman, he was startled by a quick, sharp whistle. His team jumped sideways into the ditch, and becoming unmanageable by the breaking of a line, jumped upon the track when within 60 feet of the engine, and turned and ran down the track ahead of the heavily loaded log-train. As luck would have it, the cattle-guards were packed with snow. Nothing happened to check the team, and they kept ahead of the train to the next crossing, when, with the remaining line, he was able to pull them off the track in good order. He could not turn off between the crossings on account of the high banks of snow on either side. It was, indeed, a miraculous escape from a terrible accident, for it would have been impossible for the engineer to stop the train in quite a distance, as it was heavily loaded and under good headway."

Snow-Blindness.

Many of the snow-shovelers engaged on the various railroads in the Northwest during the past week have been afflicted with snow-blindness. On the Racine & Southwestern Division of the Chicago, Milwaukee & St. Paul Railroad a whole gang, consisting of over 50 men, were made snow-blind, and many of the men are suffering severely. On the Chicago, Milwaukee & St. Paul Railroad, near Janesville, 18 shovelers were made snow-blind by the reflection of the sun on the snow, and had to be led home. Reports from other lines state that large numbers of the shovelers engaged were forced to quit work on this account. Among several hundred snow-shovelers engaged at work on the Hastings & Dakota Division of the Milwaukee & St. Paul road the other day were 16 women.—*Chicago Tribune*.

The Whistler on the Cars.

"And they always hunt in droves," said the sad passenger. "If one man begins whistling in the railroad cars, long before he gets to his first breathing spell one man and another and another, and then another, and more after that one again, take it up, until the car is a perfect cyclone of chirps and toots, and not so much as a fragment of a tune in the whole unrecognizable mass."

"Do you suppose," said Endymion, the sleepy passenger, who only got on a few stations back and had been sound asleep ever since, "do you suppose the man who whistles ever listens to the warblings of the other whistlers in the car? Because if he did, and could hear how meaningless and vacant the music was, I think he would never whistle in the car again."

And then, having pounded his overcoat into a comfortable knot, Endymion put his head down upon it and slumbered.

"Well," the fat passenger said, "what shall we do with him? I don't really think we ought to kill him."

"No," said the sad passenger, "no bloodshed. Let us fall upon him and plane the floor with him."

"Suppose," said the tall, thin passenger, "we take him out on the platform, where there will be room to swing our legs, and kick him?"

"We might wait until the train was running a little slower," said the cross passenger, "and chuck him out of the window."

"I've a good mind," said the fat passenger, "just to step up and slap his mouth while he's whistling."

"We might throw him down and pull out his teeth with a monkey-wrench," said the sad passenger, "so that he couldn't whistle any more."

"Or we might punch a hole in his lungs," said the man on the wood-box, "with a brad-awl, and that would let out his wind faster than he could whistle it up."

"Well," they all said, "let's get hold of him and give him a little whirl, any how, just for luck."

Just then the man who had been whistling stood in the aisle beside them. He was not a kind looking man, now that he had ceased whistling. He had only one eye, and his hair was white and very short. His neck was about the same breadth as his shoulders, and he had an unpleasant way, when he was not whistling, of holding his chin pretty well forward, and his nose was all wrinkled. He was taking off his coat, although the car was quite cool, and he had just thrown his hat upon the floor, although there were plenty of empty racks.

"Seems to me," he said, "that you ducks ain't overly fond of my whistling. Seems like I heard ye didn't want me to whistle no more when you was around."

There was an embarrassing silence about a foot long.—*Burlington Hawkeye*.

A Model Railroad.

A letter from Lebanon, Pa., says: "Few of the visitors to the great Cornwall iron estate, in this county, receive invitations to inspect the work-room of the young millionaire, Robert Coleman. Mr. Coleman destroyed a palace half built when his young bride died a year ago, and her embalmed body was brought from Paris to be entombed in a mausoleum here, in the shape of an Episcopal cathedral that cost \$250,000. Since the death of the young bride the grief-stricken widower has paid much attention to machinery and engineering. He had a building erected containing a single large room, with high ceiling and freaced walls. A circular roadway, with a double line of steel tracks, extends around the room. Patent safety-switches, electric crossing signals, safety-frogs, and the latest methods of fastening rails are in use on this play-house railway. The total length of the track is about 150 feet, double track, and two sidings. At one end is a round-house, with turn-tables that operate automatically. Three miniature locomotives are employed. Every piece of mechanism, every rod, bolt, screw, lever, spring, tire, cock, pipe, and pump is on these locomotives. The boiler-jackets, rods, and drivers are nickel-plated, and some of the bright work is silver-plated. The cabs are of solid walnut, and the boilers proper and the fire-boxes are of wrought steel. The tenders are of copper, and their water supply is taken by scoops from vats on the roadway while the locomotives are in motion. The locomotives are about four feet in length, including the tender, and are models of beauty. They are of English design, so far as high driving-wheels are concerned; otherwise, they are advanced American mechanical ideas, and have many original appliances of Mr. Coleman's invention. The locomotives are fired up and set in motion. Around the tracks they go, while the millionaire owner watches the movements of the miniature machinery. Hours are thus passed; all sorts of experiments are tried; high speed and low speed are compared to determine the comparative effect of friction. To develop his railway ideas, Mr. Coleman has determined to build and equip a road extending from the Cornwall estate to the Pennsylvania Railroad, a distance of about twenty miles. In all probability this road for its size, will be one of the best equipped in the country."



Published Every Friday.
CONDUCTED BY
S. WRIGHT DUNNING AND M. N. FORNEY.

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EDITORIAL ANNOUNCEMENTS.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

THE MAINTENANCE OF RATES.

The combination of the Eastern and Western roads represented by the Joint Executive Committee probably never was so near destruction as during the past few weeks. The division of east-bound freight, as has been pointed out before, is so incomplete that it by no means takes away the temptation to underbidding from all the roads. The division is only among the roads reaching the shipping points and does not extend to their Eastern connections. At Chicago, while the six roads there had no sufficient motive for cutting rates, the New York Central and the Erie had as much to gain as ever by securing the shipments that go by way of Buffalo for their respective roads as against each other, and so to a greater extent at other Western markets where the freight business is pooled. The disturbance last September arose in this way, and Mr. Fink then called attention to the imperfection of the plan as then in force, and urged the extension of the apportionment so as to fix the percentage of traffic that each of the connecting roads should receive all the way to its destination, and he has done so since. But since railroad business has become prosperous it has been difficult to get the serious attention of the parties in control to any matters of the kind. Until the evil effects of neglect become flagrant they can hardly be got to listen to a warning that danger impends, and wholly neglect to act upon a suggestion that the scheme which is only begun should be completed and perfected in order to avoid such danger. Absolute existing loss and the certainty, if something is not done, that it will do some millions of damage seem to be necessary in order to rouse the men in authority and induce them to act decisively. It is, of course, always difficult to get a large number of men to take unanimous action, especially if any of them for any reason, good or bad, is secretly in favor of a little demoralization; but in view of the vastness of the interests at stake and the position which railroad presidents occupy as trustees, it is hard to excuse the dawdling inaction which permitted a serious demoralization of rates, and serious discrimi-

nations among shippers, which came very near precipitating a general breaking up of rates that would certainly have caused the loss of some millions of dollars. We assume that all parties were seriously in favor of maintaining harmony and enforcing regular rates; all, we understand, have all the time asserted that they were; and no one is even suspected of wishing to destroy the income of the people who employ him to protect their interests—a purpose which would ruin him forever if it became known; but this makes it all the more inexcusable that the irregularities that prevailed should ever have been permitted, or that, when attention was called to them, instant action should not have been taken to put an end to them. It may be that the delay was due to the inattention or negligence of one or two men not awake to the gravity of the situation; but it seems more likely that there was a general lack of promptness and appreciation of the situation. Business had been good for some time, the companies were not pressed for means to pay their obligations, as many were until within a year or two; for some time the various difficulties that have arisen have been settled without coming to an open rupture and without causing any very large loss; the men in authority had gradually acquired the conviction that Mr. Fink would find a way out of any difficulty into which they might happen to get, forgetting that it will do no good for Mr. Fink to find a way if they will not take the trouble to walk therein. In this matter of maintaining rates where the agreements entered into cannot be enforced by law, eternal vigilance is necessary. No congress of associated companies is of any use unless it acts when necessary, and in this case it seemed too languid to act.

For some months there have been some irregularities at a few Western points. Until recently these were not numerous, but since January, and possibly longer, they became so common that they were known to all the railroad companies, and probably to most of the heavy shippers, though at no time probably were they so general as to affect more than a comparatively small fraction of the traffic. Such cuts usually begin with some of the largest shippers, who at this season are the packers; but so far as we have heard, the provision shipments were not particularly affected, but the flour shipments more; and in Chicago, the headquarters of the packing business, the cutting began much later than elsewhere, and was less common. All this time, it must be remembered, everybody pretended to be anxious to maintain rates, and there has hardly ever been less need of reducing rates to get traffic, for most of the time (largely owing to the snow blockades) the roads could not supply all the cars that were wanted. It is hard to understand what the motive could have been that caused the cutting, and our information of the manner and the parties beginning the practices is not sufficiently definite to enable us to judge; but at times when traffic is light temporarily, engagements may be made which extend over periods when traffic is heavy, and when rates have been generally maintained and traffic is good, an unscrupulous agent knows that his action, by which he increases his company's business by giving a rebate of a few cents a hundred, is less likely than at other times to be followed by a general reduction of rates, destructive to his own as to every line.

Finally, on Friday of last week, a meeting was held in New York to deal with this matter. We understand that it was attended by representatives of all the trunk lines and their immediate connections, whether controlled by the trunk lines or not, and that its action was unanimous. Its proceedings have not been made public, but we understood that it took decided action, and that, among other things, the persons assembled (presidents and officers acting for them) formally resolved to take to themselves the exclusive power of making rates and to withhold it from all subordinate officers, agents, and line agents (on whom the blame for cutting rates is usually thrown), and moreover agreed to be responsible for all rates made over their roads, however made, so that it will never be necessary to inquire who made a cut, but only if it is made; if the fact of it is established, it will be considered made by Mr. Vanderbilt, Mr. Jewett, Mr. Roberts, Mr. Garrett, etc., as the case may be.

Further, we understand that provision was made whereby, in case a cutting of rates is proved, a general and open reduction to a level of the cut rate will be made by the central authority of the combined roads. This will be likely to prevent such cuts as were made last winter, when business was good and it was believed that the cuts would not be generally followed. When a company knows that its rebate of five cents a hundred to one or two shippers at a single place will be followed, as soon as it becomes known (as it is almost sure to become known, by a general reduction

to all shippers at all places in the same proportion), it will hesitate long before making such a rebate. But at all events such a policy will be only a proper protection to shippers. During the recent troubles it is said that reductions of from three to five cents per 100 lbs. were made to the favored shippers. Now, on many staples, this is the difference between a profit and a loss to the trader.

There is a single packing establishment in Chicago on whose yearly product 5 cents per 100 lbs. amounts to more than \$100,000, and a grain shipper with a rebate of less than this amount might spoil the trade of his competitors. And just about the time when several railroad managers were arguing to legislative bodies that railroad co-operation was a public benefit, because it prevented discriminations among shippers, shippers were suffering by such discriminations through the neglect of the managers to co-operate properly. If things had gone a little further, and a general railroad war had ensued, with the endless discriminations attendant thereon, there would have been great and a just public indignation. But all is well that ends well.

Further, we understand that the companies represented agreed that a division of the shipments from the Western pooling points shall be made among the Eastern connections of the Western roads; that this division shall begin at a date near at hand, and that it shall be made by arbitration very soon if not otherwise agreed upon. This will be a most important step, and once carried out will do more than anything else to insure permanent success in the maintenance of rates. It has been urged for years, and its importance was generally assented to, but hitherto it has been impossible to bring about any positive action toward effecting it. But the prospect of the loss of several millions of dollars has at last caused something to be done, and apparently not only has a great immediate danger been escaped, but provision has been made for future security such as has never been known before.

"DRAWING-ROOM" CARS.

In all other civilized countries where railroads exist the demand for a separation of the different kinds of people who travel has been recognized, and first, second, third and sometimes fourth-class cars are provided. Until within a few years, this has been ignored in this country, and the washed and the unwashed have been obliged to sit down side by side. During the last ten years a great change in this respect has been gradually taking place. Railroad companies have found, in many places, that if they provided cars giving more comfort and some exclusiveness, many people will very willingly pay an extra charge for the privilege of traveling in them. This has been especially noticeable on the lines between New York and Boston. Besides the fact that many of these people manifest a disinclination to associate with persons whose habits and conversation are not clean, there is the other circumstance that the steamboat lines have put fares down very much lower than those charged on the railroads. The boats have thus been very much crowded, and, as the ladies say, some of them are not "nice." In fact, to use more masculine and stronger language, those which charge the lowest rates are not kept clean, and the herds of people carried are often extremely unfragrant, especially when the weather compels the closing of windows and doors.

So disagreeable has travel become on some of these lines that experienced travelers shun them, and the railroad companies find that, by providing greater comfort and faster time, they can compete with the boats without putting down the rates. The New York, New Haven & Hartford and the Boston & Albany roads have therefore been doing this, and are running several trains between New York and Boston, 234 miles, in six hours and a half, or at the rate of 36 miles per hour. This is, of course, not a very high rate of speed, but the fact must be kept in mind that it includes, we believe, eight or ten stops for draw-bridges and grade crossings, and that the line runs through many villages and a number of cities with considerable population, and in all of them, excepting New Haven, and there for a part of the distance, the railroad is on the same grade as the streets. Both of the lines referred to have recently built new cars for this service. Those built by the Boston & Albany Railroad were described in the *Railroad Gazette* of Dec. 3 of last year.

The New Haven road has just finished several cars for the same service. The only facts we can give with reference to the latter are such as could be observed during a journey in one of them from Boston to New York. The main saloon has seats for 32 passengers, and the smoking-room for four more. The latter is at an end of the car, and the porter's room, heater, toilet room and closet are at the

other end. Like nearly all the other cars on this line, these have large windows, the glass of which is 3 ft. 4 in. wide. The inside finish is of mahogany or baywood, with panels of curled maple. The head-lining is painted somewhat in the old style, but of a much improved pattern. The general design of the wood-work is also of the old style, but like that of the head-lining is much improved. The windows have rolling curtains similar to those used in the Pullman cars, and with very neat lambrequins over the tops hung with silver-plated rings on wooden poles. The material of the lambrequins is violet plush, decorated with an olive band and fringe. In the clear-story are seven of the old-fashioned, ineffective ventilators on each side, with registers in them, and the absurd grating over the inside, the only use of which seems to be to prevent passengers from knowing whether they are open or closed. Apparently none of the clear-story windows open. There are also ventilators in the ends of the clear-story, than which there are none better. In the main saloon there are five two-light silver-plated lamps. The frames of the chairs are made of mahogany, and the seats and backs are covered with crimson plush. The trucks have each six steel-tired paper wheels, with four check chains, but of insufficient size, and attached to the car by fastenings which would be totally inadequate in strength to hold the trucks in case they ran off the track. The cars have Miller platforms and couplings and Westinghouse automatic brakes.

These cars and those built by the Boston & Albany road have evidently cost a great deal of money, and were intended to give the maximum of comfort and convenience for their cost. Some criticism of their construction will therefore be timely, and as we do not know who the designers were, the latter will, we trust, not regard anything which may be said as having any personal reference. It may be said, though, that the workmanship, for which the master car-builders of the two lines are responsible, is of the most excellent character.

For some reason it has come to be regarded as essential that cars of this kind must have arm chairs in them. From this view and practice we are inclined to dissent, the reasons for which will be given further on. Whatever views may be held on this subject, it will be generally admitted that the seats, whatever kind is used, should be made as comfortable as possible. Unfortunately the persons who construct and design cars seem to have very little idea of the form and proportions of a seat which are required to make it comfortable.

Let us then give a little consideration to it, and see to what conditions a seat should conform, in order to fulfill most perfectly the purpose for which it is intended. In order to remove all personality, sentiment, or whatever name it may be known by, from the investigation, let it be supposed that we have an object somewhat like *a, b, c, d*, shown in fig. 1, consisting of a number of bars jointed together at the points, indicated by the letters, and that the top consists of a more or less heavy or light knob, and that this articulated object must be transported in somewhat the position it is represented in, and that its general character is like that of ripe fruit, which is liable to injury from bruises, or say a gilt frame, easily subject to abrasion. The problem then is to arrange a support to carry such an object without injury in the manner described. The ordinary distance from the joint *c* to the extremity *d* is about 18 in. We will then make a stand or support 18 in. high, somewhat as represented. If we do this, the vertical portion *a b* must be sustained by stays or supports to keep it in that position. If we place an inclined support behind it, as indicated by dotted lines, it will by its own gravity rest on such a support without any other stay. The greater the inclination of course the more securely the object would rest. But it will be seen that if the support for *b c* is horizontal and the vertical part *a b* of the object is inclined, the weight of the latter will have a tendency to push the horizontal part *b c* forward on the support. Therefore to give stability to the object, the support should be inclined so as to be at right angles to the back. In that case, as the bridge engineers say, the reactions would be equal.

It will be noticed, though, that owing to the size of the joint at *b*, it alone bears on the horizontal support, and it is therefore liable to be bruised or abraded. To give a uniform bearing for the horizontal member, therefore, the support should be hollowed out somewhat as indicated by the dotted lines at *e*. This will permit that part of the former between *e* and *f*, as well as the joint *b*, to rest on the support. But it will be seen that if *b c* projects some distance beyond the front *f* of the stand *e f*, the overhanging portion will produce an undue pressure on the front edge at *f*. For

this reason the width of the support should be made not less than the distance from *b* to *e*, or 18 in. In case it is desired to incline the part at *a b* somewhat more than the inclination of the back, it is evident that then the joint *b* must be moved forward from the back, and in that event the width of the support should be made greater than the length of *b c*, or 18 in., in order to support the latter along its whole length. The height of the support should be rather less than that of *cd*, because the latter may be inclined, and then the vertical height is diminished:

The knob may be supported or not. Of course, if it is it will have greater equilibrium than if it is not, but the distance from it to *a* is so short that little effort is required to keep it in a vertical position.

The reader has of course recognized before he has read thus far that under thin disguise our inanimate articulated object is intended to represent the framework of an average passenger, and that the same requirements are necessary to support the one as the other. To be comfortable to a passenger, not only the back of a seat should have a liberal amount of slope as explained, but the seat itself should also be inclined, so that there may be no tendency to slide forward in it. This is especially desirable in a vehicle where the motion has a constant tendency to jostle a passenger forward. This was well understood by the builders of the old stage coaches. Besides being inclined towards the back, a seat should be made somewhat concave to conform to the shape of the joint *b*. The comfort of old leather-bottom chairs and shoemakers' benches shows this.

Any one engaged in designing a seat is recom-

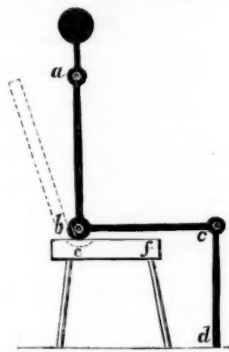


Fig. 1.

mered to make the following experiment: Take any ordinary chair, the straighter the back the better for the experiment, and place a small cushion or pillow just above the joint *b* and against the back of the seat. Nearly every one will be surprised to find how much it will add to its comfort. The physiological reasons for this we cannot now explain, but the cushion, in this position, seems to give support to the body just where it is needed. The effect, though, is to push the body forward, and the seat of the chair will then be found to be too narrow, or rather not deep enough, from the front to the back. If a chair can be procured with a sufficiently deep seat, it will be found that with the cushion placed as described, a very luxurious support can be extemporized. The depth of the seat, though, from the front to the back should not be less than 20 in. for a full-grown man, and as much as 24 in. will increase the comfort. Now it is just here that car-builders generally fail in making seats comfortable. The ordinary width of car seats is from 15 to 18 in., which is entirely too narrow to be easy. The arm chairs in the Union League new club-house in New York, which is intended as a sort of temple devoted to human comfort, are 23 in. deep by 21 in. wide, the latter measured transversely. The easy chair in which the writer lounges, when his duties permit (which is not often) has a seat 24 in. deep by 20½ wide. The chairs in some of the older cars in the New York & Boston line are only about 19 in. deep. In the new Boston & Albany cars they are 23 in. and in the New York & New Haven cars 22 in. deep, and the backs are about 26 in. high above the seats. In some of the cars the seats incline backwards, but in others they do not, and in all of them they are upholstered in that vicious convex form by using which upholsterers seem to vent their spite against the public.

The point to which we want to direct attention here especially is, that whatever superior comfort the arm chairs in parlor cars may have is due almost entirely to their greater depth as compared with ordinary car seats, and that if the latter were made as wide as the former much more comfort could be obtained.

Leaving this topic for a time, there is another illusion which is entertained regarding cars of this class. For some reason very wide windows seem to be considered a requisite in them, apparently "to put on style," as they

say in the West. A very great objection to them is that, as arranged, every alternate passenger must ride backwards, and sit facing the person opposite to him to see out the window, otherwise his vision is limited to a blank panel. Besides this objection, there is the other one that such windows are expensive, heavy and difficult to open and close. A much better plan would appear to be to give a window of ordinary size to each seat. The inconvenience of the present arrangement seems to be recognized by travelers on this line, and from the ticket agent in Boston we learn that those who travel regularly, say once a week, and who know about the location of windows, engage those seats which have the window in front. He expressed a preference for the system of small windows, in which each seat would command an entire one, and which would therefore be more desirable than the present arrangement. The agent in New York gave similar testimony, although apparently a preference for special seats was not so often expressed at the New York end as in Boston.

It is not an unusual thing either to meet with people who consider the ordinary cars preferable to the drawing-room system. After looking into the subject with considerable care, it seems as if it would be possible to make a car with seats of the ordinary plan which would in every way be preferable to any thus far built with arm chairs. The superior comfort of the latter, as has been shown, is largely due to their greater depth; therefore why not make seats, say 22 in. deep, with a reversible back in the ordinary way. In ordinary coaches the distance from centre to centre of seats is usually about 32 to 34 in. In the proposed car they might be placed 40 in. apart, thus giving abundant room for the additional width, and a little more besides. The width of windows could be increased in the same proportion, the sills being brought down to a level with the arm of the seat. There would thus be greater width, more depth, and increased "style," if that must be aimed at. It is certain that if some skill and a little ingenuity were exercised in designing such a seat, it would give more comfort than the chairs now used. Each one would, of course, accommodate two persons, but tickets could be sold so as to reserve a whole seat for one person, if he or she desired it. With a whole seat of this kind, it is possible to move about and change one's position, there is room for a traveling bag alongside, for books and papers, or to sit with a friend if desirable. Some of our countrymen who have traveled in Europe tell us that there is in reality more exclusiveness in our cars than in theirs. Here, excepting in drawing-room cars, passengers are not obliged to sit facing each other, and with the backs turned, and especially if they are high, as on the Pennsylvania Railroad, they form a small compartment for each seat. This advantage our proposed drawing-room car would have. Besides, it would seat nearly double the number of people that a chair car will, and when it becomes rusty in the service it could be used as an ordinary coach.

We have notes for a good deal of criticism of the new cars referred to, but this article has grown to such length that there is room for only a few other remarks.

The arrangement of the Boston & Albany car seems to be especially bad. In both the smoking room and main saloon there are only single doors at the end. In cold weather the passengers are consequently exposed to the "wintry blasts" every time the door is opened. In this respect the New Haven car is much better arranged. It is true the smoking room in that is exposed in the same way, but passengers are not obliged to remain there.

The ventilation of the latter, so as to prevent the smoke from pervading the rest of the car, is difficult. So long as it is at the back end of the car, all goes well, but when it is in front the smoke is almost certain to enter the other apartments. An arrangement somewhat like that of the older cars seems to be better than either. By putting some powerful exhaust ventilators in the clear-story of the smoking-room, the smoke will be drawn out of it, and the air from the rest of the car will be drawn in.

It has been remarked before in these pages that the Boston & Albany cars remind one of a huge coffin. The wood work inside is all mahogany, with no other color to relieve it, and the decoration has a sort of almost Egyptian solemnity. The lamps, on the other hand, are ornamented with an elaboration that makes it seem as though they would flutter away out of pure exuberance. It is perhaps due to this spirit that they maintain a perpetual jingle while the car is in motion. As some one regardless of grammar remarked, they are the "jinglingest" lamps he ever saw.

There is one respect, though, in which the designers of the cars for both of the roads seem to have vented a

spite against passengers. The chair frames bristle all over with sharp corners. Not one of these is rounded when it is possible to make it sharp. In some cases, in fact, where a quarter-round ornament is used it is so placed so as to make two corners where there was one before, whereas, by reversing it, there would have been none. Altogether, neither of the designs deserves very much commendation, but, of the two, those of the New Haven road are much the better. The abolition of the arm chairs and the big windows is, however, much to be desired.

The Duty to Adopt Improved Appliances.

The courts have for many years past been accustomed to say that the direction of a railroad company is to an extent under an obligation to examine and adopt improvements in railroad apparatus tending to promote the safety of the traveling public. Evidently such a rule, if carried to an extreme, might cause injustice. The number of inventions annually pressed upon the public attention which relate to railroad operation is very great, and the time, labor and skill required in anything like an early testing of them all would form a heavy burden. Moreover, most of these inventions are patented. Surely it would be an incongruity in railroad law that the federal government at Washington should give to each inventor of a supposed improvement a monopoly of his contrivance, and support him in exacting his own price upon sales of it, while, at the same time, the state courts should require the railroad companies to purchase it and give it a trial, under peril of heavy damages in case any accident could be attributed to the want of it. Fortunately a principle which, as theoretically stated, may appear objectionable, is, in the actual practice of the courts, administered with moderation and a very good degree of consideration for the rights and interests of the companies.

The application of the rule which is of most importance is that which relates to injuries to passengers; for they, of all classes of persons, have the highest legal claims to skillful provision for their safety. A decision of the Court of Appeals of Kentucky, just announced, discusses the grounds and limits of the duty very clearly and lucidly. The action was in behalf of the family of one Thomas, who was killed, while riding upon a train of the Kentucky Central Railroad, in consequence of a collision of the train with a drove of cattle which had found their way upon the track. The ordinary question of negligence in the management of the train at the moment of the disaster was not raised in the cause; no neglect of duty was imputed to the engineer or other train hands. The general good quality of the road-bed and rolling-stock was not impeached; that is to say, everything in use was good of its kind, and kept in proper repair. But counsel for plaintiff offered evidence to prove that the Westinghouse air brake is more efficient in arresting the progress of a train than are such brakes as were used on the train on which Thomas was killed. And the decision turned on the question whether the omission to adopt the improved brake exposed the company to damages. The Court said that a railroad company has not discharged its whole duty to passengers when it has provided a road and rolling-stock free from all defects, and has selected and employed suitable persons to operate the trains. It is bound, also, to add to its facilities such apparatus and appliances as science and skill shall from time to time make known, and experience shall prove to be valuable in a considerable degree in diminishing the dangers of railroad travel; provided such improvements can be procured at an expense not greater than ought to be incurred to obtain them. There is no very precise rule or law for determining, in any given case, whether it was the duty of the company to provide a designated improvement. The standard of care and diligence must not be placed so high as to render conveyance by railroads impracticable. On the other hand it is not to be reduced too low, merely in deference to alleged want of means of a particular company; a company is able to provide a safe track and sound machinery and cars should cease operations. Yet it would be unreasonable to require companies of small means and business to purchase every appliance or machine which may be found to be valuable in diminishing dangers, and which may therefore come into general use on lines of heavy passenger traffic. The rule is to be applied with reasonable regard to the ability of the company and to the nature and cost of the improvements; but within its appropriate limits, it is a rule of great importance, and one which should be strictly enforced.

In the case before the Court the evidence showed that the Kentucky Central Company had, during the year preceding the accident, declared a dividend (rate not stated) on its capital stock, which was \$5,000,000.

The cost of the Westinghouse brake was stated by the witnesses at \$500 for each locomotive, and \$200 for each car, amounting to about \$12,000 or \$15,000 as the cost of equipping the entire rolling stock. Proof was also made that the air brake had been fully tested and its utility proved, and that it was in use on many roads in the United States and gave general satisfaction. The Court declared that under these circumstances the omission of the company to introduce the improved brake was a neglect of its duty toward passengers which rendered it liable for a collision which the improved brake would have prevented.

A parallel decision is noticed in one of the most recent court reports of Missouri. It arose out of a casualty on board a steamboat; but the obligations of carriers of passengers by steamboat are not materially different in principle from those of carriers by railroad. The passenger was seated with his back to a thin partition, on the other side of which was the paddle-wheel. The periphery of the revolving wheel broke; its fragments were dashed through the partition, and the passenger was struck by them upon his back with great violence. His injuries were so severe as to require surgical treatment for several weeks, and to leave him enfeebled for life. The judge, before whom the cause was tried, told the jury that they should attribute such a disaster as this to the negligence of the steamboat owners, unless the owners had shown in defence that the wheel was constructed of the most perfect material and in the most perfect manner which care and diligence can suggest. The full bench of judges said that this language in stating the rule was somewhat too strong. They said:

"Perfection in material and construction implies an impossibility that either could be better. In order to reach this condition, nothing would suffice short of the highest achievements of inventive skill, and the most extraordinary products of manufacturing art. If after-acquired wisdom can suggest any possible precaution that might have prevented the accident, then either the material or the construction was not perfect, for lack of that precaution. While it is true that the public carrier is held to a greater degree of care and vigilance than is required of the private owner of dangerous machinery in his relations with employees or visitors, yet the courts have never demanded of him that super-excellence in all things which would apply to his arrangements the double superlative, 'most perfect.' He must use the utmost care and skill of very cautious persons. He must adopt all the precautions which have been practically tested and are known to be of value. He must use the highest degree of care which a reasonable and prudent man would use. Such is the general scope of the law, as recognized by the authorities."

It will be noticed that the high obligation to adopt new improvements is thus strongly stated only when claims of passengers are in question. The line between who is a passenger, and who is not one, with reference to his claim to enjoy the protection of the best appliances, was very strictly drawn in a recent New York decision, mentioned in a recent article in the *Railroad Gazette*. The person injured—a boy of fifteen years of age—jumped from one train while it was moving and was run over by a train coming the other way. It was shown that the casualty would probably have been avoided if the second train had been equipped with the Westinghouse air brake. But the Court said that the boy's right to enjoy the protection of the best known brakes terminated at the moment of his leap from the train on which he had been riding. He then ceased to be a passenger and, in his subsequent walking upon the track, was a trespasser. Railroad companies are not required to equip their trains with expensive apparatus for the purpose of avoiding accidents to persons who jump upon the track from moving trains.

Two recent decisions are noticed upon the obligation to use the best inventions for preventing spread of fires from locomotive sparks. In an Illinois case a hotel was burned; and the evidence showed a strong probability that the fire originated from sparks from an engine running back and forth over a road near which the hotel stood; the hotel owner, however, seemed to have neglected proper efforts to save his property. The judges said that the law, doubtless, required the company to use every possible precaution, by the use of all the best and most approved mechanical inventions, to prevent loss from fire along the line of its road. But the witnesses gave the engine a very good character in respect to shedding sparks, and on this account, and by reason of his neglect of reasonable efforts to put out the fire, the plaintiff lost his suit. In an Iowa case, a grain elevator was set on fire by sparks communicated from the chimney of a steamboat, and the fire spread to a mill and stock of lumber adjoining. The owner of the lumber yard sued the railroad company owning and operating the steamboat and elevator. His chief complaint was that the boat was not equipped with a certain improved spark arrester. The judge told the jury that the test of the company's duty in using spark arresters was: What would an ordinary prudent and careful man owning such a boat have done in that regard in the same circumstances?

In applying the test the jury must consider the necessity of steam power in modern transportation, and the importance of rendering its use economical; and must ask how far the interests of the public require those who use this great power to adopt means of safety and protection. If steamboats are required to adopt various apparatus, they must charge the increase of their expenses thus occasioned upon the products of the country transported by them; hence it is for the interest of the people that they should dispense with costly appliances, so far as they can do so without too great danger; but they should certainly be required to adopt such means as may be useful for the protection of property and persons.

In such a case a jury should ascertain what has been generally used by prudent and careful men in the management of vessels and steam power, the general usage, the experiments made and the opinions of those who have used the spark arrester; and should say whether there was, under all circumstances, any duty imposed upon the company to have a spark arrester on its vessel, at the time the fire occurred.

The Packing Season.

The winter packing season, beginning Nov. 1, closes with February. Approximate figures for the number of hogs packed at the Western packing houses in these four months are given by the Cincinnati *Price Current* as follows:

	1880-81.	1879-80.	1878-79.	1877-78.
Chicago.....	2,850,000	2,525,210	2,043,115	2,501,285
Cincinnati.....	322,425	334,550	623,584	632,302
St. Louis.....	500,000	577,793	629,281	569,540
Indianapolis.....	415,000	364,321	472,455	270,150
Milwaukee.....	320,000	340,783	414,221	371,982
Louisville.....	215,670	231,259	187,506	279,414

Total above.....	4,823,605	4,573,634	3,300,142	4,564,673
Other points.....	2,506,837	2,376,817	2,180,508	1,946,743

Total.....7,330,442 6,950,451 7,480,648 6,505,446

The number packed is therefore $5\frac{1}{2}$ per cent. more than last year, and 2 per cent. less than in 1878-79, but with that exception larger than ever before.

In these latter years, however, it will not do to judge of the whole business by the winter packing alone, because there has been a much greater increase in the summer than in the winter packing for some years, as is shown below:

Year ending Feb. 28.	No. hogs packed—		Total.	P. c. in summer.
	Summer.	Winter.		
1872-73.....	525,500	5,410,311	5,935,814	8.5
1873-74.....	1,062,016	5,466,200	6,528,116	16.3
1874-75.....	1,200,444	5,566,286	6,766,730	17.7
1875-76.....	1,262,343	4,880,135	6,142,478	20.6
1876-77.....	2,357,866	5,101,308	7,459,174	31.6
1877-78.....	2,543,100	6,505,446	9,048,546	28.1
1878-79.....	3,378,044	7,480,648	10,858,692	31.1
1879-80.....	4,051,248	6,950,451	11,001,699	36.8
1880-81.....	5,240,612	7,329,832	12,570,444	41.7

If we took the winter packing alone, we should fail to find how fast the business has grown, because the summer packing has become a much larger proportion of the whole than it formerly was, and continues to grow faster than the winter packing. In 1872-73 it was about one-twelfth of the whole; in 1875-76, one-fifth; last year, more than two-fifths. The average number packed monthly was 133,000 in the summer season against 1,366,000 in the winter season in 1873-74; last year it was 655,000 in the summer against 1,832,000 in the winter. In that time the winter packing has increased 34 per cent., and the summer packing nearly 400 per cent.

Thus the carrying of hogs and provisions is now distributed pretty well over the whole year, where formerly it was mostly concentrated in a comparatively few months of the year. This is of general advantage, doubtless, now, though when comparatively little grain was carried in the winter the concentration of the packing business then gave traffic for rolling stock that otherwise might have been unemployed.

Looking at the totals for the entire year, we find an increase last year of 14.2 per cent. over 1879-80, of 15.8 per cent. over 1878-79, and of 39 per cent. over 1877-78. The hogs packed nearly all come from the great corn-growing districts, and by far the greater part from the country south of Michigan and the south line of Wisconsin, though considerable numbers, and many more than formerly, are raised in southern Wisconsin and Minnesota and northern Iowa. But that these are a comparatively small proportion of the whole is seen by the fact that the Chicago, Milwaukee & St. Paul, with its enormous mileage, mostly north of the south line of Wisconsin, in 1877 delivered in Chicago but 315,962 hogs out of a total of 6,539,344 received there, against 997,000 received by the Illinois Central, 1,162,000 by the Rock Island, 1,863,000 by the Burlington, etc., and if we add to that the whole number packed in Milwaukee it still shows a much smaller production in the northern territory.

One of the most interesting points in connection with this business is the development of new packing centres. With the great growth of population in the Far West, and the increase in corn-growing in Kansas, Nebraska and Western Iowa, it was natural to suppose that the business would grow faster there than further east. But this has not been the case. The proportion packed in winter at places other than the six leading packing centres has varied comparatively little from one-third of the whole number. It was 34.8 per cent. in 1871-72 and 34.2 in 1880-81; was greatest in 1874-75 (37.1 per cent.), and smallest in 1878-79 (29.1 per cent.).

There have been, however, a few new packing points developed west of the Mississippi, which, if they do not take the place of any of the old leading ones, at least seem likely

to absorb the business formerly divided among a large number of places. Of these Kansas City is easily chief, and in the last season it packed no less than 341,000 head, which is more than two of the places classed among leading points—Milwaukee and Louisville—packed that season. Kansas City also shows a larger percentage of increase than any other packing point of importance—74 per cent. more than the previous year. Cedar Rapids has a considerable business, but its winter packing has not grown much recently. It packed 145,000 in the past season, and nearly the same number in each of three previous seasons.

Taking the summer and winter packing together, the business of some of these Western places for two years past has been:

	1880-81.	1879-80.	Inc. or Dec.	P. c.
Kansas City.....	580,900	341,238	Inc. 239,662	70.2
Cedar Rapids.....	46,500	28,815	" 17,685	41.2
St. Joseph.....	123,300	114,000	" 9,300	8.1
Atchison.....	225,000	395,601	Dec. 170,601	43.1

Atchison is not credited with packing any hogs last winter season in the *Price Current's* statistics, though it packed nearly as many as Kansas City in the summer season. The three Missouri River points packed 929,200 head in 1880-81, against 851,654 the previous year, an increase of 8.4 per cent.—less than the average rate of increase in Western packing in the same time. The change is chiefly by a greater concentration of the business at Kansas City. The three together packed last year more than either St. Louis, Cincinnati, Indianapolis, or any other one place except Chicago.

The latter easily keeps the lead both in winter and summer packing. In the last winter season it packed 38.9 per cent. of the whole number, against 36.6 the previous year, and of the whole year's packing it is credited with 45.5 per cent. last year, against 42.5 in 1879-80. It is noticeable that in the last year the summer packing was as great as its winter packing, which was never true before of any of the leading packing towns.

The exports of provisions during the four months of the winter packing season amounted to 265,877 tons, which is 56,589 tons, or 27 per cent., more than last year. These exports were very nearly the same both years as the shipments from Chicago for the same time, which has often been the case before—the shipments of Chicago sufficing for our exports, and those of the other packing towns for domestic consumption.

Foreign Railroad Notes.

The proposed international exhibition of railroad appliances in Berlin, of which we spoke some time ago, is to be held in 1883, and will include apparatus relating to inland navigation as well as railroad material. The place of exhibition will be the Lehrter railroad station, not now needed for traffic, whose yard is abundantly spacious. The general railroad part of the exhibition is divided into the following departments: (1) The method of construction, including ties, rail fastenings, turn-tables, frogs, switches, crossings, etc.; (2) signals, with the electric and other apparatus used in working them; (3) rolling stock, such as engines, cars, etc.; (4) cranes, hoisting machinery, etc.; (5) arrangements and methods of control of and in stations, workshops, etc.; (6) instruments and tools for measuring, testing, etc.; (7) methods of working railroads, etc.; (8) railroad literature. Extraordinary methods of working railroads will form a special class, and trials and tests must be made with them on the ground. Invitations to foreign countries will be issued early this year, through the several foreign offices, by the Prussian government, to participate in the exhibition.

The great Italian Railroad Investigating Commission, which has been taking testimony for two or three years, is to make its report by April 1. It is announced that by a large majority the Commission has adopted a resolution, affirming that the operation of the railroads by private enterprise is preferable to their operation by the state, and that the state should remain in the possession of the railroads and preserve a powerful influence over them, especially on the rates and the time-tables. It has owned the railroads some time. An example of state ownership and operation by private industry in this country is the Western & Atlantic Railroad in Georgia. The Italian Commission proposes to distribute the railroads into new systems extending north and south, which is the direction of the chief current of the traffic; whereas the existing systems extend generally across the peninsula and but for comparatively small distances north and south, as the Upper Italian, the Roman and the Southern railroads. The Commission, however, will probably make but two systems for the whole peninsula, one mostly to the west and one mostly to the east of the Apennines.

A former superintendent of the Charkov & Nicolai Railroad, at a public meeting in Russia recently, declared that the orders of the Minister of Communication caused an unnecessary expenditure of \$7,500,000 a year for working expenses on the Russian railroads, and stated that when it was thought necessary to increase the capacity of his road alone, the Minister compelled an expenditure of nearly \$20,000,000 for rolling stock, etc., when \$6,000,000 would have been amply sufficient.

During the Turkish war Russia let a contract for the building of a new road about 170 miles long from a junction with one of the Odessa roads (at Bender) to the Danube at Galatz. It was calculated that about 80 miles of it would have grades of 79 ft. per mile and 20 miles grades of 95 ft. per mile; and the contract provided that for all parts of these sections which should be made with grades no steeper than 53.8 ft. per mile the contractor should be paid at the rate of 8,000 cubic fathoms of earthwork per verst (½ mile) of length, whether there was any more or not, instead of for 600 cubic fathoms if the steeper grades were employed.

What the contractor did was to build his road on an entirely different line from that surveyed by the government and 20 miles longer, with easy grades and very light earthwork, which enabled him not only to claim pay for 8,000 fathoms of earthwork per verst, but for more versts. Strange to say the accounting commission objected to this, and instead of accepting the contractor's bill for about \$15,000,000 (for about 185 miles of nearly the worst road that ever was built, on which for some time trains of only three or four cars could be run, and these no faster than a horse could walk), they cut it down to less than \$11,000,000, and asked him to return some \$2,000,000 that he had already received.

In Russia in 1879, on 13,980 miles of railroad, 1,727 of which were laid with steel, there were 4,559 breakages of rails, and the following numbers occurred each month:

January.....	699	July.....	247
February.....	588	August.....	156
March.....	854	September.....	214
April.....	235	October.....	328
May.....	235	November.....	341
June.....	160	December.....	692

Thus in the four months December, January, February and March, 2,843 of the breakages occurred, which is five-eighths of the whole number. In these months the average number of breakages was 711 per month; in the rest of the year only 214½. This agrees very well with experience in this country.

The railroads of the German Empire (exclusive of the Bavarian roads) are reported by the Imperial Railroad Bureau to have earned in 1880 \$194,000,000, or \$7,700,000 more than in 1879, and their average earnings per mile increased from \$6,840 to \$8,857. Out of 83 roads 62 show an increase in total earnings and 49 in earnings per mile.

The *Engineer*, in a leader on "Anthracite as a House Coal," says (of the Irish anthracite): "The coal is very difficult to ignite, and must be burned in comparatively large and deep grates, or it will not burn at all. It makes an intensely hot fire, and quickly warps and destroys all cast iron with which it comes in contact. It is useless as a fuel for small rooms, such as are found in the larger number of London houses. The American anthracites closely resemble those of Ireland, and are equally unsuitable for domestic consumption."

Considering the fact that American anthracite is carried more than a thousand miles and sold for domestic consumption directly among mines of bituminous coal at two, three and four times of the price of the latter, especially because of its advantages as a house coal, this is a somewhat remarkable statement—or would be in a well-informed journal.

The Effect of the Hard Winter on Railroad Prosperity.

February earnings have so far been reported by 35 railroads, of which 21 had larger earnings this year than last, and the aggregate increase was from \$9,381,833 to \$9,815,901, or 4.6 per cent. But in the year the mileage of the roads reporting increased from about 22,700 to about 26,700 miles, or 17.2 per cent., so that there was a considerable falling off in earnings per mile—from about \$414 to \$368, or 11 per cent. When we take into consideration the much larger working expenses this year, it is evident that profits in proportion to capital must have been much smaller this year. But while these losses are insufficiently appreciated by the general public, yet if they were generally known doubtless they would have an unduly great effect on the prices of railroad securities; for these influences are temporary, and, where the effect is worst, will probably only reduce profits to the extent of one or two per cent. on the stock of the suffering company, leaving it just as capable as if the season had been most prosperous to earn good dividends hereafter. This tendency to capitalize any temporary profit or loss is almost universal in American money markets, and is an indication of inexperience in the art of investing, or of speculative investors. What the roads have lost this winter, or failed to make of what they were expected to earn, is the whole extent of their loss—often more; for many of them will earn more after the winter months because they could not do their full amount of work during those months. The loss may make a good deal of difference with one half-year's dividend, but that is the whole of the actual injury to the stock, however great may be the effect on its market price. An exception will be the effect that exceptionally severe winter may have on the settlement of the new country where it has caused inconvenience or suffering. What that effect will be may be judged better when we have definite reports from the people who have passed the winter in these snow-bound districts. The very severe cold will doubtless deter some intending immigrants, but the deep snows and blockades will not be likely to have much effect unless cost of living was considerably increased thereby. Farmers, and especially farmers in a new country, are accustomed to lead isolated lives in the winter, and to lay in stocks of the few supplies they purchase for long periods, and they can do little more out-door work in a mild than in a severe winter. Further, there is now no great area of very cheap fertile lands, suited to the kind of farming to which most immigrants are accustomed, except in the region where the winter has been so severe—Northern Nebraska, Western Minnesota and Dakota. The fertile lands of Southern Nebraska and of Kansas are held at much higher prices, and scarcely any are left that can be entered under the homestead law within the belt where there is rain enough to make agriculture safe, and most immigrants are not accustomed to the agriculture best suited to Texas, whose large immigration is chiefly from the Southern States, though it gets many more Northern immigrants

than any other Southern state. But some effect the severe winter certainly will have. Some who would have gone to Minnesota or Dakota will now prefer to pay higher prices for land in Nebraska, Kansas, or even go to Texas or not immigrate at all. This effect on immigration may be of great importance to several companies, for the profits of most of the lines in Western Minnesota and Dakota depend upon the occupation of that country, and if this is delayed for several years some of them may be a burden instead of a support to the companies owning them.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Atchison, Topeka & Santa Fe.—Extended from Rincon, N. M., south by west to Deming, 75 miles.

Southern Pacific.—Extended from Deming, N. M., eastward, 63 miles.

Peoria, Decatur & Evansville.—Completed by laying track from Grayville, Ill., north 2 miles, and from Poseyville, Ind., northwest to the Wabash River, 16 miles.

Savannah, Florida & Western.—This company's *Waycross & Florida* line is extended southeast to St. Marys River, Ga., 17 miles. Gauge, 5 feet.

This is a total of 173 miles of new railroad, making 427 miles reported thus far this year, against 733 miles at the corresponding time in 1880, and 204 miles in 1879.

A NEW ROUTE TO THE PACIFIC is opened by the completion of the Atchison, Topeka & Santa Fe Railroad to a connection with the Southern Pacific at Deming. From Kansas City to Deming the distance (over the Atchison, Topeka & Santa Fe) is 1,154 miles; from Deming to San Francisco (over the Southern Pacific and Central Pacific), 1,208 miles, making the distance from Kansas City to San Francisco 2,362 miles, against 1,916 from Omaha to San Francisco. From Chicago the distance is about the same to Kansas City (or Atchison) as to Omaha; but from New York the distance to Kansas City by the shortest route is 1,342 miles, and to Omaha 1,402 miles. Thus the new route is considerably the longest in distance; but as trains run quite slowly by the northern route, it will not be difficult (though somewhat costly) to make as good time by the new route as is made now by the Union Pacific. At the rate trains run on the Union Pacific the additional length of the southern route will require nearly 24 hours time, but as the average speed on the old line is but 19 miles per hour, this can be made up by running trains on the new line about 23½ miles an hour. The new line is likely to get a fair share of the through traffic, from this direction at least; in the other it will depend chiefly upon the disposition of the Central Pacific, which works both roads and may prefer to send traffic by the route which will give it the largest profits. Passengers, especially those who expect to make the trip but once, are very likely to take one route in one direction and the other in returning, thus seeing as much as possible. A good deal has been claimed for the new route on account of its freedom from snow blockades; but we doubt if the possibility of a snow blockade on the Union Pacific will drive from it in winter as many passengers as the certainty of the infernal heat on the Southern Pacific in Arizona and the California desert will deter from attempting that route in the summer. But no doubt the new route will get a good share of the through passengers, and the loss of them will be quite seriously felt on the old line, the rates being high and yielding a good profit. The competition of the new route, however, will not be nearly so serious a matter as it would have been a few years ago, when the local traffic was comparatively trifling.

The country that is likely to profit most by the new line is the mining region of Arizona, which heretofore has had to get its supplies from the Atlantic coast by shipping them 3,300 miles west to San Francisco, and then 1,000 or 1,100 miles southeast. However, rates on this traffic are not likely to be low now. These scattered mines are about all there is to give local traffic on some 700 miles of road.

Rates, it is understood, will be the same by the new route as they have been by the old one. The Central Pacific, working both lines on the west, is in position to control this, and it is not likely to consent to anything which will reduce its profits.

LAKE RATES have been indicated during the winter by numerous charters taken at Chicago for vessels to receive grain, hold till the opening of navigation and then take to Buffalo, and the rates quoted have been generally 8 cents per bushel, but latterly shippers, it is said, have refused to pay more than 6 cents, though no charters are reported at that rate. Rates opened last year at 6 cents per bushel for corn. Last year the winter rates for holding and carrying were 7 cents for corn and 7½ for wheat—lower than this winter—and this in spite of the fact that there was such an accumulation at the elevators by mid-winter that some roads at times were unable to deliver grain in Chicago, so that the part of the charge for storage must have been greater than this year, when the excess of receipts over shipments since navigation closed has been very much less than last year. Thus the indications at present are that the rates will open as high as last year, for contracts would not have been made at the rates named, especially when elevator storage could be had easily, if lower rates were anticipated in Chicago, where both shippers and carriers have the fullest information. But much depends on two things yet to happen: First, the time when navigation opens, and second, the amount carried to the East by the railroads before that time. It seems

probable that there will be unusually heavy deliveries of grain at the lake ports hereafter, to make up for what has been kept back by the snow, though in this much will depend on the condition in which the roads are left after their fight with the elements. But if this is the case the roads to the East must carry much more than they have before this winter or there will be a great accumulation at the lake ports, especially if navigation does not open before the 1st of May, which is usually the case after a hard winter. But if the elevators are full when navigation opens, there will be more than the vessels can carry, and they will command high rates for some time. It will be the policy of the railroads to the East, however, to carry all they possibly can before navigation opens at any rate not lower than their summer rate; until then they will get all the grain that moves; afterwards, only a part of it. It seems to us extremely questionable whether a 30-cent rate, which was had all last summer, can be had by the railroads long after navigation opens this spring, though at present it must be said that the demand for vessels is brisk in the lumber and ore trades, and there is not much probability that lake rates will be low at the opening. Possibly they may be later in the season, and especially after harvest, when there will be considerable additions to the lake fleet, and these generally of the most effective kind—carrying big loads and making quick trips.

NEW YORK, LAKE ERIE & WESTERN EARNINGS have now been reported for January and for the first four months of the fiscal year. For January the earnings were 11.3 per cent. greater this year than last, which is more than could be expected, the Pennsylvania's earnings in the same month having increased but 3.4 per cent. The Erie, however, is this year working 67½ miles more than last year (the Buffalo & Southwestern road), to which some part (but probably only a small part) of the increase is due. Though this increase in gross earnings is probably greater than on most of the trunk lines, it is not so great as this road has had in previous months. Thus in December the increase was 23.4 per cent., and in three months ending with December, 17.2 per cent. Moreover, as on so many other roads, the increase in working expenses in January was so great as to more than balance the increase in receipts, leaving a decrease of 12.7 per cent. in the net earnings of the month. The gross earnings working expenses and net earnings of the road in January for four years past have been:

	1878.	1879.	1880.	1881.
Gross earnings....	\$1,314,018	\$1,147,173	\$1,306,381	\$1,443,437
Expenses.....	959,793	960,031	946,565	1,137,988
Net earnings....	\$354,225	\$187,142	\$359,816	\$305,449

The gross earnings, therefore, were larger this year than in any other of the four, but the net earnings smaller than in 1878, as well as smaller than last years. The expenses which had varied little in the other three years, were 20.2 per cent. more than last year. This increase was doubtless largely, but not wholly, due to the snow; larger traffic, larger mileage, and higher prices also contributing.

For the four months of the fiscal year the earnings, expenses and profits of the road have been:

	1877-78.	1878-79.	1879-80.	1880-81.
Gross earnings....	\$5,875,437	\$5,277,851	\$5,924,158	\$6,867,473
Expenses.....	3,857,046	3,579,415	3,950,654	4,432,732
Net earnings....	\$2,018,391	\$1,698,436	\$1,973,504	\$2,434,741

The increase in gross earnings over last year is very great—nearly 16 per cent.; but the increase in expenses is 12.2 per cent., leaving for the four months an increase of \$461,237, or 23.4 per cent., in net earnings over last year, and of 20.7 per cent. over 1877-78. As from this time on both gross and net earnings were very large last year, we shall probably not see hereafter such increases in them as were common in 1880, though better results may be expected than are reported for January on those which will have to be reported for February.

THE READING ELECTION, which seemed likely to decide the future policy of the road, brings nothing but a law-suit. Mr. Gowen two days before the election gave notice that he should not vote the proxies which he held, and should claim that the meeting was a special one, at which by the charter more than half the stock must be represented to make its action valid. Doubtless the McCalmont party will claim that the meeting was a regular and not a special one, and Mr. Gowen being in possession there will be a suit to oust him. It must be remembered that the election regularly takes place in January, but it was postponed by order of the Court. Mr. Gowen, it appears, had more than one-half of the stock, but much or most of it had not been registered in time for the January meeting, and it was contended that only the stock qualified to vote at that time could vote at the postponed meeting. Mr. Gowen is one of the toughest fighters in the world, and he may be trusted to use all his magnificent ability, energy and perseverance to carry his point, or, at least, to keep his opponents out as long as possible. Whether he will succeed, or even whether he ought to succeed, we will not pretend to judge.

JANUARY PROFITS we may now judge by the reports of eight railroads that up to this time have reported their expenses as well as their earnings for that month, the most important of which are the Pennsylvania, the New York, Lake Erie & Western, the Iron Mountain and the Burlington, Cedar Rapids & Northern. The net earnings of these eight roads, three of which had a larger mileage this year than last, decreased from \$2,104,946 to \$1,730,878, or 18 per cent., and only two of the eight show any increase in profits. We may not accept this as representing the average

progress made, the number of roads reporting being so small a proportion of the whole, but there can be no doubt that there was generally some decrease in profits.

THE EFFECT OF THE NORTHWESTERN STORMS is shown very sensibly by the receipts of Chicago and Milwaukee. For the first two weeks of March the Chicago receipts of grain were not half as great as in 1880 or 1878, and the Milwaukee receipts were 71 per cent. less than last year, and but little more than one-fifth as great as in 1878. The blockade not reaching far south of Chicago, its tendency is to force shipments that would otherwise go to or through Chicago to pass eastward by routes further south, such as the Wabash, the Indianapolis, Bloomington & Western, etc., but the interruption is chiefly near by the places of original shipment, and such freight cannot move in any direction until the roads are cleared.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:
Boston, Concord & Montreal, special meeting, in Plymouth, N. H., March 21, to vote on the question of issuing \$200,000 new bonds to pay for improvements and extension of the road.
Pennsylvania, annual election, at the general office, No. 233 South Fourth street, Philadelphia, March 22. The polls will be open from 10 a. m. to 6 p. m.
Shenandoah Valley, annual meeting, in Luray, Va., April 5.
Atchison, Topeka & Santa Fe, annual meeting, at the office in Topeka, Kan., April 21, at 10 a. m.
New Haven & Northampton, special meeting, in New Haven, Conn., March 21, to vote on authorizing a mortgage on the Northern Extension.

Dividends.

Dividends have been declared as follows:
Chicago, St. Paul, Minneapolis & Omaha, 1½ per cent., quarterly, on the preferred stock, payable April 20.
Western Union Telegraph, 1½ per cent., quarterly, payable April 15.
Boston & Albany, 2 per cent., quarterly, payable March 21.
Chicago, Milwaukee & St. Paul, 3½ per cent. on the preferred and 3½ per cent. on the common stock from the earnings of 1880, payable April 16. Transfer books will close March 29.
Missouri Pacific, 1½ per cent., quarterly, payable April 1.

Mail Service Extensions.

New mail service has been ordered over railroad lines as follows:
Atchison, Topeka & Santa Fe.—Service extended from Socorro, N. M., to Deming, 100 miles.
Southern Pacific.—Service extended from Tucson, Arizona, to Deming, N. M., 230 miles.
 These extensions complete the mail service over the new southern line to the Pacific.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—The following circular from the General Manager is dated Topeka, Kan., March 5: "Mr. Erastus Young, Auditor, having resigned, Mr. H. C. Clements has been appointed Acting Auditor; his appointment taking effect the 7th inst. All reports, statements, and other matters for the Auditing Department should hereafter be addressed to Mr. H. C. Clements, Acting Auditor, Topeka, Kan."
 Mr. J. M. Meade, for four years past connected with the Bridge Department, has been appointed Division Engineer in charge of track and bridges of the Eastern Division, from Newton, Kan., to Atchison.

Atlanta & Charlotte Air Line.—At the annual meeting in New York, March 9, the following directors were chosen: Belden D. McAlpine, Hiram Sibley, Rochester, N. Y.; P. P. Dickinson, Wm. H. Fogg, Richard Irvin, Jr., W. B. Isham, Eugene Kelly, R. A. Lancaster, H. W. Sibley, Francis Smith, James H. Young, New York; Skipwith Wilmer, Baltimore. The only new director is Mr. Lancaster, who succeeds Hon. Abram S. Hewitt. The board re-elected H. W. Sibley, President; C. H. Pierce, Secretary and Treasurer; G. J. Foreacre, General Manager.

Bodie Railroad & Lumber Co.—The directors of this new company are: R. M. Graves, J. B. Low, H. M. Quay, A. J. Ralston, W. Willis, W. S. Wood, H. M. Yerrington. Office in San Francisco.

Brooklyn Underground.—The directors of this new company are: J. M. Balch, O. B. Baldwin, E. D. Berri, Wm. Burden, I. F. Carey, Edward Friel, John French, T. K. Horton, J. M. Leavitt, B. T. Lynch, H. Mumford, J. L. Nutting, G. Wilson; Mr. S. McElroy is Engineer.

Buffalo, Pittsburgh & Western.—At a meeting of the board of directors held March 4, Mr. Oliver Watson, Jr., was elected Auditor of this company in place of Mr. Wm. Henderson, resigned.

Chicago, Burlington & Quincy.—Mr. Wirt Dexter has been appointed General Solicitor, in place of J. M. Walker, deceased. He was Mr. Walker's law partner for some time, and stands at the head of the Chicago bar.

Chicago, St. Paul, Minneapolis & Omaha.—Mr. E. W. Winter is appointed Assistant to the President. Mr. Charles F. Hatch is appointed General Superintendent, in place of Mr. Winter.

Cincinnati, Indianapolis, St. Louis & Chicago.—Mr. C. S. LaPollette has been appointed Assistant General Passenger Agent, with office in LaFayette, Ind., and will have special charge of the local business.

Civil Engineers' Club, of Cleveland.—At the annual meeting of this association in Cleveland, O., March 12, the following officers were chosen for the ensuing year: President, Charles Paine; Vice-President, J. M. Wilson; Corresponding Secretary, M. E. Rawson; Recording Secretary, C. H. Burgess; Treasurer, C. A. Walter.

Cleveland, Tuscarawas Valley & Wheeling.—At the annual meeting in Cleveland, O., March 9, the following directors were chosen: W. W. Holloway, E. P. Rhodes, Bridgeport, O.; H. B. Perkins, Warren, O.; Clement Rue-

sell, Massillon, O.; Selah Chamberlain, James Mason, R. P. Myers, Amasa Stone, W. S. Streator, Cleveland.

Danville, Mocksville & Southwestern.—Mr. Hugh Longest has been appointed Master of Road, with office at Leaksville, N. C. As the road is not yet built he will probably have charge of construction. Mr. Longest was lately Master Car-Builder of the Long Island road, and at one time was Assistant Master of Road on the Baltimore & Ohio.

Denver & Rio Grande.—Mr. John Doherty has been chosen Treasurer. He has been connected with the Pennsylvania Railroad for many years.

Ft. Wayne, Muncie & Cincinnati.—Mr. George B. Campbell has been appointed General Passenger and Ticket Agent, in place of G. W. Mullen, resigned.

Grand Rapids & Indiana.—At the annual meeting recently the following directors were chosen: H. J. Hollister, W. O. Hugbart, W. R. Shelby, Grand Rapids, Mich.; J. G. Wait, Sturgis, Mich.; S. S. Cobb, Kalamazoo, Mich.; Pliny Hoagland, C. A. Zollinger, Ft. Wayne, Ind.; J. N. McCullough, Thomas D. Messler, Wm. Thaw, Pittsburgh, Pa.; John P. Green, George B. Roberts, Philadelphia; Robert B. Potter, New York. The only new director is Mr. Green (Assistant to the President of the Pennsylvania Railroad), who succeeds Thomas A. Scott. The board re-elected W. O. Hugbart, President; W. R. Shelby, Vice-President and Treasurer; J. H. P. Hugbart, Secretary.

Indianapolis, Decatur & Springfield.—Mr. George A. Smith has been appointed Traffic Manager, in place of G. T. Nutter, resigned. Mr. J. S. Lazarus is appointed General Agent.

Kentucky & Indiana Bridge Co.—The officers of this company are: President, Bennett H. Young, Louisville, Ky.; Vice-President, Morris McDonald, New Albany, Ind.; Secretary, George Lyman.

Knex & Lincoln.—At the annual meeting, March 10, the old board was re-elected, as follows: John F. Berry, Francis Cobb, Rockland, Me.; Edmund Wilson, Thomaston, Me.; E. O. Clark, Waldoboro, Me.; D. W. Chapman, Damariscotta, Me.; Edwin Flye, Newcastle, Me.; Henry Ingalls, Wiscasset, Me.; George A. Preble, Bath, Me.; F. G. Richardson, Portland, Me. The board re-elected John T. Berry, President; E. Wilson, Secretary; L. S. Alexander, Treasurer.

Lake Champlain & St. Lawrence.—At the annual meeting last week the following were chosen: President, A. B. Chaffee, Montreal; directors, Wm. Donahue, T. A. Mackinnon, Montreal; James O'Halloran, Cowansville, P. Q.; Lucius Robinson, Newport, Vt.; Bradley Barlow, F. A. Metcalfe, St. Albans, Vt.; Emmons Raymond, Thomas Vose, Boston. The road is controlled by the Southeastern of Canada.

Minneapolis & St. Louis.—Mr. C. F. Hatch having resigned, retired from the management of this company Feb. 28. By direction of the President, Mr. A. H. Bode will for the present assume the duties of General Manager, and to him all communications regarding the general affairs of the company should be addressed. Mr. Bode is Treasurer and General Freight and Ticket Agent.

National Association of General Passenger & Ticket Agents.—At the convention in New York last week the following officers were chosen: President, W. B. Shattuck, New York, Pennsylvania & Ohio; Vice-President, C. T. Wilson, Cincinnati Southern; Secretary, A. J. Smith, Cleveland, Columbus, Cincinnati & Indianapolis.

New Orleans & Northeastern.—Mr. Wm. Seymour is Chief Engineer of this projected road. Mr. H. H. Peever is Assistant Engineer in charge of the New Orleans Division.

New York, West Shore & Buffalo.—At a meeting held in New York, March 10, the following directors were chosen: Charles Bard, W. B. Dickerman, Charles S. Hinchman, Theodore Houston, Walter Katte, Wm. Long, John J. McCook, Henry R. McHarg, John L. Nesbitt, George G. Neviers, John B. Page, Samuel A. Strang, Alexander Taylor. The company is controlled by the New York, Ontario & Western.

Northwestern Ohio.—At the annual meeting in Toledo, O., March 11, the following directors were chosen: Frank Jones, G. W. Layng, Toledo; R. F. Smith, Cleveland; John F. Davidson, J. N. McCullough, Thomas D. Messler, Wm. Thaw, Pittsburgh. The road is leased to the Pennsylvania Company.

Ohio Railroad Commission.—The Governor of Ohio has appointed Hon. H. Sabin Commissioner of Railroads and Telegraphs for that state, in place of General J. S. Robinson, resigned. Mr. Sabin sat in the state Senate last year, and is said to be an educated and independent man, but without any railroad experience.

Old Colony.—Mr. Charles R. Haskins has been appointed Lost Car and Freight Agent, in place of A. B. Watson, resigned.

Paris, Georgetown & Frankfort.—The officers of this company are: President, D. W. Lindsey; Secretary, H. L. Hood; Treasurer, Grant Green; Chief Engineer, J. L. Meigs. Offices at Frankfort, Kentucky.

Pittsburgh, Cincinnati & St. Louis.—At the annual meeting in Columbus, March 15, the following directors were chosen: D. S. Gray, Columbus, O.; W. H. Barnes, J. N. McCullough, Thomas D. Messler, Wm. Thaw, Pittsburgh; A. J. Cassatt, J. N. DuBarry, J. P. Green, H. H. Houston, Wistar Morris, George B. Roberts, J. Price Wetherill, Philadelphia; Robert Sherrard, New York. Messrs. Cassatt and Green are new directors, replacing Strickland Kneass and Thomas A. Scott.

Mr. Wm. F. Black is appointed Superintendent of the Cincinnati & Muskingum Valley Division, in place of C. C. Waite, transferred to the Little Miami Division.

Rochester & Pittsburgh.—Mr. Wm. E. Hoyt has been appointed Chief Engineer of this road, recently the Rochester & State Line. Mr. Hoyt is from Boston, and was recently Locating Engineer of the projected New York, Chicago & St. Louis road.

St. Louis & San Francisco.—The new board has elected Gen. E. F. Winslow President; Calvin Littlefield, Secretary; F. W. Lillie, Treasurer.

Texas, Topolovampo & Pacific.—The directors of this new company are: B. R. Carmen, Mazatlan, Mexico; Jesus Escobar, El Paso del Norte, Mexico; W. S. Chapman, San Francisco; J. B. Price, Jefferson City, Mo.; A. R. Owen, Chester, Pa.; Henry Hastings, Medford, Mass.; Benjamin F. Butler, Lowell, Mass.; Josiah G. Abbott, T. A. Dodge, T. B. Lewis, F. O. Prince, E. E. Pratt, G. W. Simmons, Boston; E. A. Buck, Ulysses S. Grant, Jr., New York.

Union Bridge Co., of Toledo.—At the annual meeting in Toledo, O., March 11, the following directors were chosen: Frank Jones, G. W. Layng, J. N. McCullough, for the Pennsylvania Company; R. Andrews, J. C. Gault, J. R. Osborn, for the Wabash, St. Louis & Pacific.

PERSONAL.

—Mr. George W. Mullen has resigned his position as General Passenger Agent of the Ft. Wayne, Muncie & Cincinnati and the Whitewater roads.

—Mr. Emile Low, late Chief Engineer of the Pittsburgh & Western road, has gone to Mexico as Assistant Engineer of the Mexican Central line.

—Mr. H. E. Sargent has, it is understood, tendered his resignation as General Manager of the Northern Pacific road, but it has not yet been acted on by the board.

—It is reported that the position of General Manager of the Northern Pacific has been offered to Mr. W. C. Van Horn, now Assistant General Manager of the Chicago, Milwaukee & St. Paul.

—Mr. Florence J. Donahue, for 27 years Master Mason of the Boston & Albany road, died in Springfield, Mass., March 13. He had lived in Springfield 33 years, and was employed as contractor in the building of the Connecticut River road before he went to the Boston & Albany.

—Hon. A. J. Edgerton, just appointed Senator from Minnesota to succeed Mr. Windom, now Secretary of the Treasury, was Railroad Commissioner of his state from 1870 to 1874. He is the second Railroad Commissioner in the new Senate, Mr. McDill, of Iowa, being the other.

—The Buffalo Commercial Advertiser says: "A report has been in circulation for some days that Mr. M. C. Woodford, of the Fort Wayne & Jackson Railway, has been tendered the position of General Manager of the Canada Southern, and that Mr. W. P. Taylor, the present Manager, would be promoted to some other office on a Vanderbilt road. We have information from an official source that there is no truth in the statement."

—Mr. D. W. Hitchcock, of the Union Pacific, will sail in a few days for Australia, for a six months' trip. He will act as joint agent of the Union Pacific, the Central & Southern Pacific, the Atchison, Topeka & Santa Fe Railroad lines and the Pacific Mail Steamship Company. The purpose of the trip is to make an effort to direct Australian European travel via San Francisco and across the American Continent by rail.

—The New York Tribune says: "Mr. Francis S. Bond, who has been selected by the McCalmonts, of London, as their candidate for president of the Reading Railroad, in opposition to the Gowen party, was formerly senior aide-de-camp to General W. S. Rosecrans at the time when he was commander of the army of the Cumberland, and President Garfield was his chief of staff. During the long halt at Murfreesboro, Tenn., after the battle of Stone River, Mr. Bond and General Garfield were roommates; and in the Chattanooga campaign they tented together, 'messing,' however, with Rosecrans. Mr. Bond is still a young man, being not over forty-two or three. His brother, Mr. William Bond, is a banker in this city. A number of other associates on Rosecrans' staff of President Garfield are established in this city. Inspector-General Horace Porter is at the head of the Pullman Palace Car Company, and is prominent in railway affairs."

TRAFFIC AND EARNINGS.

Grain Movement.

For the week ending March 5 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1874.....	1,428,500	831,826	1,324,097
1875.....	2,091,195	822,327	1,725,878
1876.....	2,431,476	1,912,005	2,432,802
1877.....	2,431,476	1,641,102	2,719,709
1878.....	2,883,118	2,341,877	3,253,417
1879.....	2,945,233	1,743,635	4,307,569
1880.....	3,893,233	2,285,216	8,791,968
1881.....	2,757,801	1,564,359	3,456,497

The receipts and the shipments of the Northwestern markets are smaller than in the corresponding week of the three years previous, but the receipts are larger than for three weeks previous; while the shipments have been smaller twice this year, and were so generally last winter until March, when the rate was reduced to the figures that prevailed throughout the past winter. The Atlantic receipts are the largest of the year, though smaller than in the corresponding week of 1879 and 1878.

Of the Northwestern receipts St. Louis had 39.2 per cent.; Chicago had 31.8; Peoria, 11.2; Detroit, 6.6; Toledo, 4.9; Milwaukee, 3.9; and Cleveland, 2.4 per cent. The receipts of Chicago and Milwaukee especially were greatly reduced by the snow blockade, which is doubtless the cause that makes the St. Louis receipts largest—never before reported so in any week, we believe. This is further seen by the fact that the Chicago wheat receipts were but 86,170 bushels—not one-sixth of the total—its wheat at this season coming chiefly from the roads which have been most obstructed.

Of the Atlantic receipts New York had 34.7 per cent., Baltimore, 24.3; New Orleans, 19.5; Philadelphia, 11.0; Boston, 8.2; Portland, 2.1, and Montreal, 0.2 per cent. In spite of an increase in the total, the New York, Boston and Philadelphia receipts are the smallest for three weeks (New York's very little less than the week before), while the Baltimore receipts are the largest since November, and the New Orleans receipts are the largest since April, and were exceeded but twice in 1880, though there were two weeks last September when they were nearly as large. New Orleans receipts are likely to be very irregular. The arrival of a single tow of barges may give it more than the average week's receipts. Thus a single tow dispatched from St. Louis, March 6, carried 353,000 bushels.

Exports of flour and grain from Atlantic ports, for five successive weeks, have been:

	March 9.	March 2.	Feb. 23.	Feb. 16.	Feb. 9.
Flour, bbls.	113,111	114,946	111,022	120,932	89,284
Grain, bush.	3,607,058	2,808,277	1,758,010	2,476,801	2,194,050

Thus the exports of the last week are much larger than in any other of the five.

For the eight weeks ending March 9 the exports compared with those of the corresponding weeks of last year have been:

	1881.	1880.	Inc. or Dec.	P. c.
Flour, bbls.	951,497	498,654	I. 452,843	103.0
Wheat.....	10,873,817	9,016,325	I. 1,857,492	20.6
Corn.....	7,254,497	12,825,543	D. 5,571,046	43.4
Rye.....	311,440	363,364	D. 51,924	14.3
Peas.....	119,553	213,120	D. 93,567	44.0
Oats.....	20,493	D. 20,493	100.0	
Total grain	18,559,307	22,438,847	D. 3,879,540	17.3
Flour and grain, bu.	22,840,043	24,547,790	D. 1,707,747	7.0

The great decrease has been in corn and the great increase in flour, and the increase in flour has been equivalent to about two-thirds of the total decrease in grain. The decrease in corn has probably been fully made up by the increase in the provision exports—that is, in value, not in weight;

and the decrease is doubtless due, not to a smaller crop of corn, but to a larger crop of hogs and the more general fattening of them, due to higher prices.

Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending Dec. 31:

	1880.	1879.	Inc. or Dec.	P. c.
Atlanta & Charlotte Air Line.....	\$951,688	\$777,298	I. 174,390	22.4
Net earnings.....	319,510	251,621	I. 67,889	26.6
Bur. & Mo. River in Neb.....	3,112,605	2,727,240	I. 385,365	14.3
Net earnings.....	1,964,497	1,717,967	I. 246,530	14.4
Cairo & St. Louis.....	413,687	296,987	I. 116,700	54.4
Net earnings.....	84,066	45,921	I. 38,145	82.9
Chicago, Bur. & Quincy.....	17,341,890	14,779,715	I. 2,562,175	17.3
Net earnings.....	9,127,094	7,551,492	I. 1,575,602	20.8
Houston & Tex. Central.....	3,740,998	3,205,683	I. 535,315	16.7
Net earnings.....	1,758,442	1,431,913	I. 326,529	22.8
Hunt. & Broad.....	313,312	253,525	I. 59,787	23.5
Net earnings.....	152,384	141,304	I. 11,080	7.9
Knox & Lincoln.....	123,585	104,367	I. 19,218	18.5
Net earnings.....	49,105	47,301	I. 1,804	3.8
Montpelier & Wells River.....	86,480	84,520	I. 1,960	2.2
Net earnings.....	20,639	19,558	I. 1,072	5.5

Two months ending Feb. 28:

	1881.	1880.	Inc. or Dec.	P. c.
Bur., Cedar Rap. & No.....	\$292,260	\$349,488	D. 57,228	16.4
Chi., St. P., Minn. & O., East. Div.....	230,520	197,449	I. 33,071	16.8
St. P. & S. C. Div.....	166,404	169,456	D. 3,052	1.8
Flint & Pere Marq. Ind., Bloomington & West.....	255,264	228,016	I. 27,248	12.0
Nash., Chatta. & St. L.....	173,544	170,458	I. 3,086	1.8
Net earnings.....	360,009	306,789	D. 53,220	7.0
N. Y. & New England.....	131,708
Peoria, Dec. & Evansville.....	366,176	314,139	I. 52,037	16.4
St. L. A. & T. H. Bellefonte Line.....	77,774	39,428	I. 38,346	98.3
St. Paul, Minn. & Man.....	128,344	110,966	I. 17,378	15.7
Month of January:	413,669	317,884	I. 95,785	30.1

	1881.	1880.	Inc. or Dec.	P. c.
Boston & N. Y. Air Line.....	\$20,438	\$21,567	D. 1,129	5.2
Net earnings.....	11,115	13,236	D. 2,121	16.1
Bur., Cedar Rap. & No.....	167,750	184,317	D. 16,567	9.0
Net earnings.....	34,928	81,130	D. 46,202	57.0
Des Moines & Ft. Dodge.....	24,968	18,779	I. 6,189	32.6
Net earnings.....	11,093	8,254	I. 2,839	34.2
Memphis, Pad. & No.....	18,897	19,328	D. 431	2.3
Net earnings.....	4,935	3,772	I. 1,163	30.6
Mn. & St. Louis.....	50,403	42,888	I. 7,515	17.5
N. Y., Lake Erie & West.....	1,443,437	1,296,381	I. 147,056	11.3
Net earnings.....	305,449	349,816	D. 44,367	12.6
Paducah & E. town.....	42,688	37,277	I. 5,411	14.6
Net earnings.....	14,230	14,349	D. 119	0.8
St. L., Iron Mt. & So.....	570,957	555,983	I. 14,964	2.7
Net earnings.....	142,467	267,841	D. 125,374	16.8

Month of February:

	1881.	1880.	Inc. or Dec.	P. c.
Bur., Cedar Rap. & No.....	\$124,510	\$165,171	D. 40,661	24.7
Chi., St. P., Minn. & O., East. Div.....	101,965	92,044	I. 9,921	10.8
St. P. & S. C. Div.....	54,673	81,034	D. 26,361	32.5
Flint & Pere Marq. Ind., Bloom. & West.....	119,886	118,024	I. 1,862	1.6
Nash., Chatta. & St. L.....	83,261	89,960	D. 6,699	7.4
N. Y. & New England.....	190,866	191,155	D. 289	0.2
Peoria, Dec. & Evansville.....	176,427	149,908	I. 26,519	17.7
St. L. A. & T. H. Bellefonte Line.....	37,167	21,571	I. 15,596	72.5
St. Paul, Minn. & Man.....	60,660	54,749	I. 5,911	10.7
Month of March:	150,482	137,645	I. 21,837	15.8

Second week in February:

	1881.	1880.	Inc. or Dec.	P. c.
Chi. & Eastern Ill.....	\$28,207	\$22,697	I. 5,510	24.0
Chi., Mil. & St. P.....	93,000	189,923	D. 96,923	51.0
Denver & R. G.....	92,359	35,590	I. 56,769	159.4
Louisville & Nashville.....	213,900	146,100	I. 67,800	46.4
St. L. & San. Fran.....	50,400	46,858	I. 3,542	7.5

Week ending March 5:

	1881.	1880.	Inc. or Dec.	P. c.
Grand Trunk.....	\$195,302	\$194,708	I. 594	0.3

Coal Movement.

Coal tonnages for the week ending March 5 are reported as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Anthracite.....	480,679	344,772	I. 135,907	39.4
Semi-bituminous.....	76,975	50,317	I. 26,658	53.3
Bituminous, Penn.....	40,905	61,992	D. 21,087	19.5
Coke, Penna.....	50,078	37,532	I. 12,546	33.4

Coal transportation is very active as the spring advances and the blockades which have troubled many of the roads are broken.

The coal tonnage of the Pennsylvania Railroad for two months to the end of February was as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Anthracite.....	206,908	153,413	I. 53,495	33.2
Semi-bituminous.....	347,818	394,119	D. 46,301	11.7
Bituminous.....	551,730	365,056	I. 186,674	51.2
Coke.....	365,848	288,097	I. 77,751	27.0

Total.....1,272,313 1,203,585 I. 68,728 5.7

The tonnage of all kinds for February was 620,155 tons, against 654,158 tons in January.

Chicago coal receipts for the two months ending Feb. 28 were:

	1881.	1880.	Inc. or Dec.	P. c.
Anthracite.....	90,082	88,916	I. 1,166	1.3
Bituminous.....	332,837	270,139	I. 62,698	23.2
Total.....	422,919	359,055	I. 63,864	17.8

All were by rail, of course. The total shipments for the two months were 110,504 tons, a decrease of 1,309 tons, or 1.2 per cent.

Chicago and Milwaukee Receipts.

Receipts of grain, flour and hogs at Chicago and Milwaukee for the two weeks ending March 14 have been for four years:

	1878.	1879.	1880.	1881.
Grain, bu.....	3,512,822	2,747,066	3,604,785	1,474,480
Flour, bbls.....	166,638	159,317	104,926	129,498
Hogs, head.....	165,091	179,226	245,060	129,421

Chicago:

	1878.	1879.	1880.	1881.
Grain, bu.....	624,655	580,913	456,281	131,604
Flour, bbls.....	91,378	99,884	67,951	36,494
Hogs, head.....	8,339	9,042	15,140	5,663

Compared with last year there is at Chicago a decrease of

55½ per cent. in grain and of 47 per cent. hogs, and an increase of 23 per cent. in flour. At Milwaukee there is a decrease of 71 per cent. in grain, of 46 per cent. in flour, and of 63 per cent. in hogs. At both places the grain and hog receipts were much smaller this year than in the corresponding two weeks of any of the three previous years—due doubtless to the snow blockades.

Grain Elevators at Council Bluffs.

The Union Elevator Company has been organized to build grain elevators in Council Bluffs, Ia., to meet the demand of grain buyers and shippers on the railroads terminating there. The incorporators are Sidney Dillon, Union Pacific; A. L. Hopkins, Wabash; A. Keep, Chicago & Northwestern; Hugh Riddle, Chicago, Rock Island & Pacific; C. E. Perkins, Chicago, Burlington & Quincy.

Pacific Passenger Rates.

A conference between officers of the Atchison, Topeka & Santa Fe and the Southern Pacific was held at Deming, N. M., at which it was arranged that through trains should begin to run March 17. The following through passenger rates were agreed upon:

	First class.	Second class.	Third class.
Between Los Angeles and Kansas City.....	\$112.00	\$104.00	\$78.00
Los Angeles and New York.....	138.50	105.00	65.00

Second and third class tickets are all limited. Between San Francisco and New York the through passenger fare will be the same as by the Central and Union Pacific roads.

Charge for Stopping Freight Cars en Route.

The Chicago & Alton Railroad last week issued the following circular, directed to agents and shippers:

"Hereafter a charge of \$5 per car for each stop will be made for stopping cars en route for the purpose of filling out car or to unload part of the freight."

"The agent at the station at which cars are stopped will make notation on way-bill 'Car stopped at'—station to fill out load, or 'unload part of freight,' as the case may be, and sign his name thereto, showing the charge for such stop in freight column on way bill, and also on stub attached to the way-bill, if for a shipment of live-stock, for which the live-stock form of way-bill is used."

"A way-bill, for the charge thus shown on the original bill, must be made by the agent at the station at which car is stopped against the station to which car is billed, and forwarded by first train to the agent at that station, taking same to account in usual way. Upon receipt of such way-bill, the agent will erase the charge for stopping car, shown on original way-bill, and abstract both way-bills in the usual manner."

THE SCRAP HEAP.

Locomotive Building.

The Central Vermont shops in St. Albans, Vt., have just turned out a mogul freight engine with 19 by 24 in. cylinders. They have in progress another of the same size and have just begun one which is to have 20 by 24 in. cylinders. The passenger locomotives of the Cincinnati, Indianapolis, St. Louis & Chicago road are to be furnished with the Ashton patent blow-back safety valve.

The Taunton Locomotive Works, at Taunton, Mass., have lately shipped several heavy engines to the Union Pacific; also some freight engines to the Cincinnati, Sandusky & Cleveland.

Car Notes.

The New England Car Co., of Boston, has closed contracts to supply its patent screw lever dump cars to the Naugatuck and the Providence & Springfield roads.

Mr. Luce, of Detroit, has invented an iron passenger car on a new plan, and proposes to build one for trial, which is to be 82 ft. long, with seats for 100 passengers. He claims that it will weigh the same as an ordinary wooden car with 60 seats.

A large part of the works of the Wakefield Rattan Co., at Wakefield, Mass., was destroyed by fire on the morning of March 12; loss, \$200,000, partly covered by insurance. The shops will be rebuilt at once.

The Griffin & Wells Foundry Co. has been organized and will begin the manufacture of car-wheels in Chicago at once, having leased premises. Mr. T. A. Griffin, Secretary of the Griffin Car Wheel Co., of Detroit, is General Manager of the new concern.

The Woodruff Parlor & Sleeping Car Co. has ordered 18 new cars, two from the Barney & Smith Manufacturing Co., at Dayton, O., and the other 16 from Wilmington.

The Philadelphia & Reading shops, in Reading, Pa., are to build 1,500 new coal cars.

The Logan Iron Co., in Mifflin County, Pa., is putting up machinery for making car links.

The Georgia Railroad Co. has bought the old Markham rolling mill property in Atlanta, Ga., and will build new car shops there.

The Ohio Falls Car Co., at Jeffersonville, Ind., is building 150 coal cars for the Cairo & St. Louis road.

A new company has been organized to build car works at Marietta, O. Its capital stock is \$50,000.

The Puget Sound Iron Co. has its furnace at Pt. Townsend, Washington Ter., nearly finished. It will burn charcoal, and is expected to make about 20 tons a day.

The St. Albans Rolling Mill Co. is now rolling steel rails from foreign blooms. The steel furnace is being repaired. Smith, Vail & Co., in Dayton, O., have bought a lot of about two acres and will put up at once new buildings for their steam pump works. The new shops will include a machine shop, 250 by 60 ft.; blacksmith shop, 40 by 40 ft.; foundry, 60 by 120 ft.; testing room, 24 by 60 ft.; boiler and engine houses, and will have room for 200 men.

The Rail Market.

Of steel rails the *Iron Age* says: "The mills are so full of work that they find it difficult to meet the demand, and are equally unwilling to see their customers fall into other hands. They keep on entering orders, therefore, in the hope that something may turn up to let them out, depending in some measure on their increased plants being available at an early date, and in other cases are sending blooms to be rolled at mills previously employed on iron rails. Sales during the week have been kept very close, but we hear of \$61.50 to \$62.50 having been paid for summer delivery, and higher at mills. West of the Alleghenies foreign rails are quoted at \$62 to \$63 in store and for shipment, with more disposition to meet buyers' views for the deferred deliveries. American rails are not pressed for sale, but we are informed that manufacturers are disposed to accept about \$60 for such deliveries as they are in a position to make."

Iron rails are stronger and quotations are \$47 to \$48 per ton at mill for heavy rails and \$49 to \$52 for light sections, which are just now most in demand. Orders are chiefly for small lots, but the mills are generally busy. Very little business is reported in foreign rails.

Old iron rails are generally higher. Philadelphia quotations are \$27.50 to \$29 per ton, with light stock. Steel rail ends are quoted \$20 to \$31 at mill.

Spikes are steady at \$2.75 per 100 lbs.; fish-plates, \$2.50; track-bolts, \$2.70 to \$3.15, according to specification. Some concessions from these prices are reported made on large orders.

The Shaw Locomotive.

The Shaw locomotive has just been completed by the Hinkley Locomotive Co. in Boston, and is now on the Boston & Providence Railroad for trial. Our readers will remember this engine has two cylinders on each side connected to opposite cranks. As usually happens with such experimental machines, some modifications were found necessary as soon as it was tried. At the time the writer saw it—which was last Saturday—it had not drawn a train. It would be easy to predict the future of this machine, but it might appear ungracious and therefore it may as well be left to work out its own salvation.

OLD AND NEW ROADS.

Atchison, Topeka & Santa Fe.—The junction with the Southern Pacific at Deming, N. M., is about 75 miles south by west from the late terminus at Rincon, and 1,154 miles from Atchison. Work is now progressing steadily on the branch from Rincon to El Paso, which is about 70 miles long.

Baltimore & Ohio.—The Philadelphia *Times* of March 16 says: "There is something very important afoot in relation to the effort of the Baltimore & Ohio Railroad to reach New York by an independent route. Robert Garrett, the third Vice-President of this company, and its active spirit in the absence of his father in Europe, was in Philadelphia yesterday in conference with President Gowen, of the Reading Railroad, on the subject. They were together for three hours. It is understood that the conference was in reference to the way in which a connection can be formed with the Reading Railroad without going over the three-mile Junction road. As the Baltimore & Ohio Company cares very little for the passenger business from either New York or Philadelphia, but is most interested in the transportation of freight, it is said that a line is to be constructed outside of the city, although adding three miles to the distance. On western freight the Baltimore & Ohio people think they can counterbalance this by the shortness of their route to Baltimore. The great aim of the Baltimore & Ohio Company is to enter into competition for the tremendous freight business of New York and Philadelphia with the West and South. Their design, it is asserted, should they fail to get into Philadelphia, is to have freight received by the Reading Railroad in the city and taken out to the junction of the road which they propose to build."

"In stock circles the opinion prevails that the Baltimore & Ohio are now substantially the owners of the Delaware Western Railroad and its charter, giving the right to build extensions. From Wilmington comes the definite statement that Col. McComb, the principal owner of the Delaware Western road, has contracted to deliver 4,500 shares to Mr. Garrett, who agrees in return that his road will build the line to Philadelphia and Baltimore. In order to fulfill his contract Col. McComb is reported to have purchased 1,300 shares from William T. Carter, of this city. Mr. Garrett is also credited with having secured the stock in the Delaware Western formerly held by Drexel & Co. R. R. Robinson & Co. and Elliott, Johnson & Co., two Wilmington bankers, have been buying up all the Delaware Western stock they can get for Colonel McComb. It is also said that a formal transfer of the Delaware Western Road was made yesterday to the Baltimore & Ohio Company, through its counsel in Wilmington, Levi C. Bird. A report that Samuel Canby and others were out at Kiamensi yesterday, making surveys, strengthens the belief that the Baltimore & Ohio people mean business."

Bangor & Piscataquis.—The people of Bangor, Me., have voted against a proposition for the extension of this road to Moosehead Lake.

Bodie.—The Bodie Railroad & Lumber Company has been organized in California to build a railroad connecting the Bodie mining district with the Virginia & Truckee road.

Brooklyn Underground.—This company has been organized to build an underground railroad in Brooklyn, N. Y., from the end of the East River Bridge approach through various streets to Malbone street, Flatbush, where connection will be made with the Brooklyn, Flatbush & Coney Island. Branches are also proposed to Broadway in the Eastern District, to South Brooklyn and to East New York. Under the present law the consent of one-half the property owners on the line is required before the road can be built.

Buffalo, Pittsburgh & Western.—Work has been begun on the extension of this company's River Division from Irvineton, Pa., to Salamanca, N. Y., about 40 miles. Work will soon be begun also on a branch to Bradford, Pa., about 20 miles long.

Canada Southern.—The long pending suit of this company against the International Bridge Company came up for final argument before the United States District Court at Syracuse, N. Y., last week. The chief point under discussion was what constituted reasonable tolls on traffic passing over the bridge. The Court reserved its decision.

Central Vermont and Northern War.—The St. Albans (Vt.) *Messenger* of March 11, says: "After negotiations extending over a period of more than three weeks the committee representing the roads between this point and Boston have arrived at a settlement of the difficulties into which they fell some time since regarding the through western freight, which has resulted in the diversion of a large amount of business to the Cheshire and Fitchburg roads. Inasmuch as the natural route for this traffic is by the way of Concord all parties made concessions to bring about these amicable relations which are absolutely necessary to enable them to transport with safety and speed the immense amounts of freight which now seeks an outlet from the West. The conditions are not yet public, and are to be submitted to the directors of the several roads for ratification. It is to continue for one year, and may be dissolved on 90 days' notice. The roads between White River Junction and Boston are to unite in the appointment of a manager, who is to have charge of all the traffic received from the Central Vermont. It is understood that the Lowell Railroad is to proceed with the scheme for developing terminal accommodations upon their Mystic property in Boston."

The Boston *Evening Traveller* of March 16 says: "It has been an open secret in railroad circles for several days that the Central Vermont Railroad Company would to-day inaugurate a railroad war on passenger rates between Boston and Chicago. The tickets had been all prepared, and bear a coupon entitling the holder to a rebate on presentation of the same at the Chicago office, bringing down the actual fare to five dollars from Boston to Chicago."

"This proposed reduction of rates was directed against the Boston & Albany and New York Central railroads in retaliation for the recent cutting of rates from Montreal to Boston by the Delaware & Hudson, in which that road has had the co-operation of the Boston & Albany road."

"But it turns out at the last moment that the Central Vermont is not the master of the situation. The contract heretofore pending between it and the lower roads, as announced in the morning papers, has not been executed, and it is now conceded by all the parties interested that this traffic contract which has latterly occupied so much of the time of the officials of the Central Vermont line is not likely to be consummated at present, if at all. The failure of the contract with the lower roads has left the Central Road powerless for the reduced rates to Chicago at \$5, as intended. To add still further to their discomfiture the Connecticut River Railroad has given notice to the Central Vermont to surrender the possession of the Sullivan Railroad. So the Central Vermont Railroad, instead of occupying the position and playing the part of a dictator, is likely to be compelled to pay some regard to the rights and interests of others, as it has not been in the habit of doing heretofore."

Chelsea Beach.—This company has asked the Massachusetts Railroad Commission for a location for its road. It is to run from the Eastern Railroad at Oak Island to Point of Pines on Revere Beach, and will be about three miles long.

Chicago & Eastern Illinois.—This company's coal traffic has been very large during the past winter and has been limited only by its ability to furnish cars. It has recently added to the equipment 200 coal cars, which can carry 20 tons each, and more are still needed.

The Danville & Grape Creek Company, owner of a coal branch built last year, has been formally consolidated with this company, adding seven miles to the road owned.

Cincinnati Southern.—The Ohio Legislature has passed the bill authorizing the sale or lease of this road by the trustees. The bill provides that, in case a permanent lease is made, the lessees shall be required to deposit \$3,000,000 in Cincinnati city bonds as a guarantee for the faithful performance of the conditions of the lease.

Connecticut & Passumpsic Rivers.—On the morning of March 18 the engine-house of this road at Derby Line, Vt., was destroyed by fire; the passenger car used on the Stansted Branch was also destroyed and the engine badly damaged. The loss is estimated at \$15,000. The cause of the fire is unknown.

Des Moines & Ft. Dodge.—The stockholders have voted to extend this road from Ft. Dodge, Ia., northwest. The location of the extension is intrusted to the board of directors. The company also voted to authorize the execution of a mortgage and the issue of bonds on the extension to an amount not to exceed \$15,000 per mile.

Detroit, Mackinac & Marquette.—This company has already a considerable force at work, although the snow is still deep on the ground. The force will be increased as fast as possible, as the road is to be finished this summer.

East Line & Red River.—On March 14 regular trains on this road began to run to the new terminus at Greenville, Hunt County, Tex., which is 123 miles from Jefferson.

Galveston, Houston & Henderson.—It is reported that Jay Gould has secured control of this road, and that he intends to enlarge its terminal facilities and build a large wharf in Galveston.

Hannibal & St. Joseph.—Notice is given that 25 sinking-fund land-grant bonds have been drawn for redemption and will be paid on presentation to the Farmers' Loan & Trust Company in New York. The numbers drawn are 12, 22, 148, 180, 181, 227, 327, 357, 376, 390, 392, 397, 431, 455, 482, 538, 575, 589, 608, 667, 672, 723, 731, 750 and 789. Interest on these bonds will cease from May 15.

Housatonic.—There is some talk of an extension of this road from Pittsfield, Mass., north to Williamstown, about 22 miles. The line would be parallel to and from three to six miles west of the North Adams Branch of the Boston & Albany; it would reach several iron mines and one furnace, and might secure some local business.

Illinois Central.—During the month of February the traffic on this company's line was as follows:

	1881.	1880.	Decrease.	P. c.
In Illinois.....	\$421,235.00	\$487,268.86	\$66,033.86	13.6
In Iowa (leased lines).	71,616.00	124,536.65	54,920.65	43.3
Total.....	\$492,851.00	\$611,805.51	\$120,954.51	19.7

The Iowa lines were blocked by snow a considerable part of the month.

During February, 1881, the land sales were 2,158.65 acres for \$13,516.87, and the cash collected on land contracts was \$12,606.25.

Kentucky & Indiana Bridge.—This company has been formed by the consolidation of corporations recently organized in Indiana and Kentucky. The company intends to build a railroad and highway bridge across the Ohio from near New Albany, Ind., to a point just west of the city of Louisville. The capital stock is to be \$1,500,000, and the company expects to have the support of the Louisville & Nashville and the Ohio & Mississippi roads. The bridge will be about 2,500 ft. long, and will be a high bridge, without a draw-span, the channel span to be made of such length and height above the water as not to interfere with the passage of boats.

Knoxville & Cincinnati Southern.—Surveys have been completed of two lines for this proposed road from Knoxville, Tenn., to Emory Gap on the Cincinnati Southern. The distance by both lines is about 42 miles, and some heavy work will be required on either, including several tunnels. The estimated cost of the road is \$1,370,000 with grades of 60 ft. to the mile, or \$1,477,000 if the highest grades are reduced to 52.8 ft. to the mile. The engineer thinks that it will be advisable to build about six miles of branches, to reach the Indian Creek and Winter's Gap coal mines. An effort is to be made to raise the required money, and subscriptions will be called for both in Knoxville and Cincinnati. The right of way has been secured for nearly half the road.

Knoxville & Ohio.—This company is building two miles of road at a point some five miles north of Knoxville, Tenn., in order to straighten and improve its line.

Lookout Mountain.—This company has been organized to build a railroad from Chattanooga, Tenn., to Lookout Mountain, chiefly for pleasure travel. It will climb the mountain by an inclined plane worked by stationary engines.

Nashville, Chattanooga & St. Louis.—This company makes the following statement for February and the eight months of its fiscal year, from July 1 to Feb. 28.

	February.	Eight months.
Gross earnings.....	\$190,866.14	\$1,393,752.64
Expenses.....	90,312.38	857,743.72
Net earnings.....	\$91,553.76	\$536,008.92
Interest and taxes.....	39,891.32	313,616.12
Surplus.....	\$51,662.44	\$222,392.80
Real estate.....	\$16,272.75	
Iron brid es.....	15,200.00	
Improvements N. W. Div.....	65,993.15	
New equipment.....	159,628.10	
		257,094.00

Excess of expenditures..... \$34,701.20

Since July last this road has added to its rolling stock 3 new engines, 122 new box cars, 50 new flat cars, 50 new coal cars and 6 new passenger cars, costing \$159,628.10.

The surplus over interest and taxes for the eight months was equivalent to 3 1/4 per cent. on the stock.

New Orleans & Northeastern.—A survey of this projected line from New Orleans to Meridian, Miss., has been begun. The engineers are now locating the first section from New Orleans to Pearl River.

New Orleans Pacific.—Work on this road has been much delayed by bad weather through the winter. To hasten its completion an additional contract has been let to A. J. Lane & Co., of Macon, Ga., who will put on a large force at once. Tracklaying has been begun at Shreveport, La., and, as soon as rails are received, it will be begun in both directions from Alexandria.

Newport & Richford.—The Missisquoi & Clyde Rivers road having passed into possession of the bondholders through a strict foreclosure, they have organized the Newport & Richford Company. The road extends from Newport, Vt., to the Canada line near Richford, and is worked by the Southeastern, of Canada.

New York, Lake Erie & Western.—Plans have been prepared for new shops at Hornellsville, N. Y., to replace the present ones. The plans are for a substantial brick building with iron and slate roofs, and include a machine and erecting shop 470 by 110 ft., with a transfer-table running along the whole front; round-house 316 ft. diameter; boiler shop, 155 by 80 ft.; smith shop, 155 by 70 ft.; shop for light repairs, 100 by 64 ft.; tool-room, 70 by 54 ft.; engine-house, 80 by 36 ft., with chimney 80 ft. high, and other smaller buildings, including oil-room, store-house, office, etc. It is not yet decided when work will be begun on the new shops.

The track of the Newburg branches, from Greycourt to Newburg and from Turners to Vail's Gate, was changed from 6 ft. to standard gauge on March 16. Including sidings and yard tracks, about 40 miles of track had to be changed.

New York & New England.—The Rhode Island Supreme Court has decided in favor of this company's right to take possession of the Hartford, Providence & Fishkill road. It will be remembered that the city of Providence refused to surrender the bonds of that road which it held, claiming that the contract under which the New York & New England paid the bonded debt and took possession was not valid. The Court holds otherwise, and the possession of the road is now assured.

This company intends this year to extend its second track from Walpole, Mass., to Franklin, 8 miles, and to lay a second track from Williamantic to Hartford, 31 1/4 miles. Between Franklin and Williamantic, 59 miles, a number of additional sidings are to be laid, which can next year be made part of a second track between those places. A number of new stations have been built on the line, and a new freight yard is now being made in Hartford. The company is paying special attention to the local business out of Boston, and purposes building new equipment especially for its suburban trains. To meet the demands of business orders are now out for 4 passenger engines; 8 mogul and 8 consolidation freight engines; 10 passenger, 4 combination and 2 baggage cars; 134 box, 100 flat, 100 gondola, 100 coal-dump and 200 caboose cars.

The extension from Brewsters, N. Y., to the Hudson River will, it is expected, be finished in a few weeks after the spring fairly opens. When that is finished the company intends to begin on other new work, first, probably, a connecting line from Brookline to enable the trains of the Woonsocket Division to enter Boston on the track of the main line instead of by the Boston & Albany as at present. A cross line from Hyde Park to the Woonsocket Division will also be built. It is also proposed to extend the Southbridge Branch from Southbridge, Mass., to North Brookfield or Palmer as soon as possible. In case a satisfactory agreement can be made with the Norwich & Worcester Company as to the lease of that road, it will probably be extended from Allyn's Point to Groton, opposite New London.

Northern Pacific.—It is stated that a syndicate, the representative of which is Mr. Henry Villard, President of the Oregon Railway & Navigation Company, has lately purchased something over \$25,000,000 of the common and preferred stock of this company, with the expectation of securing control of the management. By the last report the company had \$49,000,000 coupon and \$43,612,645 preferred stock outstanding; the preferred has probably been somewhat reduced since then, as it is receivable at par in payment for land. It is understood that the main object of the syndicate is to prevent opposition to the Oregon Company's lines in Oregon, the road down the Columbia now nearly finished being parallel to the Northern Pacific's projected line from Astoria to Portland. A change of management, if made, would not at all interfere with the completion of the Pend d'Oreille Division, or of the gap across Montana, as it would be very much to the advantage of the Oregon Company to have the road completed, providing the

competing line down the Columbia is abandoned. It is said that the syndicate will do nothing toward a change until the annual meeting in September.

Ohio & Mississippi.—Surveys have been made for a branch line from Watson, Ind., to New Albany, about seven miles. The branch has been proposed for several years.

Pennsylvania.—The usual committee was appointed at the annual meeting last week to nominate directors to be voted for at the coming election. This committee has nominated all the old board for re-election except Mr. James McManes, who declines further service. In his place they nominate Mr. H. H. Houston, who has been long connected with the company.

Sealed proposals will be received at the office of Wm. H. Brown, Engineer of Maintenance of Way, No. 233 South Fourth Street, Philadelphia, until March 24, for furnishing labor and materials required to complete grading and masonry for third and fourth tracks between Ardmore and a point west of Radnor, 5½ miles.

Peoria, Decatur & Evansville.—The track is now all laid on the extension of this road in Indiana, completing the line of 250 miles from Peoria, Ill., to Evansville, Ind. Through trains will begin to run about April 1. The company has lately received three new locomotives, four sleeping cars and some freight cars, and has orders out for several more engines and a number of freight cars.

Peoria & Pekin Union.—It will be remembered that this company was organized by the companies in interest to work and manage the several tracks connecting Peoria, Ill., with Pekin, and the yards in those places. The track of the Peoria, Pekin & Jacksonville, between Peoria and Pekin, has been conveyed to the company.

The Union Company has also voted to issue \$1,500,000 first mortgage and \$1,500,000 income bonds, to be secured by a mortgage on all property owned, and also on the leases executed by the various companies using the line.

The *Peoria Transcript* of March 15 says: "Mr. C. H. Hudson, one of the most accomplished railroad engineers and superintendents in the West, is expected here daily to make surveys and plans for the reorganization of the tracks and yards of the Peoria & Pekin Union Railway in this city. The reorganization will be radical and complete, and will be made with the view of accommodating the railroads and the public alike. It will include the erection of large passenger and freight depots, the former to be a spacious and ornamental structure, which will be an honor and credit to the city. One of the directors of the Union Railway, speaking of the Union passenger depot, says it will be as fine in proportion as the court house. It will probably be located on the lower half of the block fronting on Water street and bounded on the sides by Oak and Chestnut streets. Not having been able to agree with the property owners as to the price to be paid, the Union railway has commenced proceedings in the County Court for the condemnation of the property, the price to be determined by commissioners appointed for the purpose. The Union Railway expects to spend between \$300,000 and \$500,000 for improvements in this city during the coming year."

Philadelphia & Reading.—In Philadelphia, March 12, the Court of Common Pleas gave a decision on the McCalmont party's application in relation to the meeting to be held March 14. The first of the seven sections into which the decree was divided only reaffirmed the appointment of Mr. George M. Dallas to preside at the meeting as master. The second ordered the judges of election to ascertain the number of stockholders present in person or by proxy, and to take separate accounts of all who were registered three months ago and all registered at present. The third authorized the President and managers to make a statement of the affairs of the company for the past year, if they so wished. The fourth section in full is as follows:

"The judges of election shall then proceed, under the supervision and direction of the master, to hold an election for a president, six managers, a treasurer and secretary of said railroad company. At such election the judges shall receive and count the votes of all stockholders duly registered as such at the time of the election, but a separate count shall be kept of the votes of such stockholders as shall have been registered for three calendar months previously thereto."

The fifth section allowed a vote in order after the election, to postpone; and if there has not been time enough to transact all business, the master was authorized to postpone for not more than 48 hours. The master or chairman and the judges of election were directed by the sixth section to report the proceedings, the voting, and separate counts of the votes as directed above, including the separate registrations of stockholders, and the Court will declare the result. Mr. J. B. White was appointed as secretary of the meeting.

At the request of Mr. Bullitt, of counsel for the McCalmonts, the Court added a seventh section reading as follows:

"If objection shall be made to the vote of any stockholder at the election, the judges of election shall make a minute of the objection, the facts of the case and the decision thereon, and report the same to the Master, and if objection be made to the vote of any stockholder upon any matter other than the election, the Master shall decide thereon; and the master shall report to the Court the said several objections, the facts thereof, and the decisions of the judges or the Master respectively."

Immediately on the delivery of this decree Mr. Gowen issued a circular to his supporters advising them to stay away from the meeting. He claimed that he held proxies for a majority of the stock and that the interests of his friends could best be served by the failure of the meeting.

This advice was generally followed and the meeting on March 14 was attended only by the opposition, a few of the Gowen party being present to watch the proceedings. The meeting was conducted strictly in accordance with the orders of the Court, and the time was chiefly taken up in hearing and entering objections to the reception of certain proxies. The proceedings were quiet and somewhat tedious. A few votes were cast for Mr. Gowen, and the opposition voted the following ticket: For President, Frank S. Bond; for managers, George F. Tyler, Samuel R. Shipley, John S. Newbold, Edward T. Steel, Charles Parish, John Lowber Welsh; for Treasurer, Samuel Bradford; for Secretary, Edgar L. Kinsley.

The following letter from Mr. Gowen to the chairman was read:

"DEAR SIR: I have in my possession up to this morning proxies of 1,988 shareholders representing 372,853 shares of the Philadelphia & Reading Railroad Company, constituting a clear majority of all the bona fide stockholders of said company. As no decision has been announced by the Court upon the question of the effect of the new registry, and fearing that it may possibly be determined that new registry for three months of a large number of shares represented by me might enable a minority of the shareholders to elect a ticket opposed to the wishes and policy of a very large majority, I have determined to run no risk of such result, and therefore will abstain from attending the meeting at which you have been called upon to preside, believing that in this way I can, in a perfectly proper and

legal manner, give effect to the real wishes of a very large majority of the shareholders of the company."

Immediately after the meeting the chairman and the masters began to make up their report, and the result will not be announced until the report is ready, probably not till March 19. The opposition estimate that their ticket, headed by Mr. Frank S. Bond, received the votes of about 220,000 shares that had been registered over three months. Of the 685,000 shares of the company, about 271,000 were disfranchised by non-registration three months ago, and about 50,000 of these were voted on Monday and counted in the schedule ordered by the Court for those registered now and not registered three months ago. Many of these 50,000 were among the 44,570 votes cast for Mr. Bond, for which Mr. Gowen has subsequent proxies.

The legal point on which the decision will probably turn is the question as to whether the meeting was an adjournment of the annual meeting or a special meeting. The company's charter requires that a majority of the stock must be present and vote at a special meeting to give the proceedings validity; at an annual meeting this is not required.

Picatinny.—The United States government has lately bought a large tract of land in the hill country of Morris County, N. J., where it is building extensive works for the manufacture of gunpowder and magazines for its storage. Rail connection with the Picatinny Powder Depot, as it is named, is desired, and an offer has been made to build a branch there in connection with the New Jersey Central's High Bridge Branch. The Ordnance Department recommends that the government give the right of way and pay one-half the cost of the road through its own property on condition that the road is built within a reasonable time from Port Oram to the Green Pond mine, giving connection not only with the Central, but also with the Delaware, Lackawanna & Western and the New Jersey Midland; that a suitable depot and sidings be built at such point as the government may require; that the company shall agree to handle all government freight without delay and at fixed rates. The government will also prescribe the location through its own property and have certain powers of regulation over the road, so as to insure the safety of the magazine and mills and the proper dispatch of its own business. The whole matter will now have to go over until the next session of Congress, as an act of that body is required to make the necessary grants of property.

Pittsburgh, Bradford & Buffalo.—This company has been formed by the consolidation of the Emlenton, Shippensburg & Clarion (Emlenton, Pa., to Clarion, 30 miles), the Foxburg, St. Petersburg & Clarion (Foxburg to Jefferson, 13 miles), and the Foxburg, Kane & Bradford, whose yet unfinished road is to extend from Clarion to Bradford, about 55 miles. The completed roads are of 3 ft. gauge.

Pittsburgh & Western.—There is a report that this road has been sold to the Baltimore & Ohio. The object of that company, it is said, is to extend the road to Butler and make it part of a line to the oil regions, using the Karns City & Butler, the Parker & Karns City and the Foxburg, St. Petersburg & Clarion roads as portions of the road. The Butler oil region, however, produces much less than formerly now, and the oil traffic from it is no longer considered valuable.

Plymouth, Kankakee & Pacific.—The Court has confirmed the sale of this unfinished road under foreclosure, which was made June 12, 1877.

Pullman Southern Car Co.—This company's sleeping car lines are run by the Pullman Palace Car Company, and its organization is controlled by that company. Capt. George H. Moore, of Louisville, has made a proposition to lease the company's property and run its lines for five years, paying interest on the debt and 6 per cent. dividends on the stock. The proposition will be submitted to the stockholders at the annual meeting, which will take place May 12 next.

Reading & Chesapeake.—This company has been organized to build a railroad from Reading, Pa., southward to the Maryland line, about 45 miles. It is to be extended from the state line to a point on Chesapeake Bay by a Maryland organization. A branch from New Holland to Lancaster, about 15 miles, is also contemplated.

St. Louis, Jerseyville & Springfield.—A Jerseyville, Ill., dispatch says: "The construction of the St. Louis, Jerseyville & Springfield Railroad was contracted March 11, except the Tunnel Division—about six miles at the river. There were 32 bidders. Mr. B. D. Haines, of Brattleboro, Vt., was awarded the earth work, and S. Bothwell & Co., of this city, the timber work. The line, as located, connects with the great lines at Springfield, goes through Bates, Loomis, Waverly, Vancil's Point, Palmyra and Chesterfield, goes one mile north of Medora, passes through Fidelity and Jerseyville to the river to Grafton, probably via Elsbah, where the bluff will have to be tunneled about 900 feet. The maximum grade of the road will be 46 feet, and only 40 feet excepting the Tunnel Division. The road bed between Jerseyville and Springfield is to be completed by Aug. 1 next, and between Jerseyville and the Tunnel Division by Sept. 1, and the Tunnel Division ready Oct. 1, 1881. The contract for the Tunnel Division will be let this week."

Sandusky, Ashland, Millersburg & Straitsville.—This company has filed articles of incorporation to build a railroad from Sandusky, O., south by east to Millersburg and thence south to Straitsville in the Hocking valley coal region. The distance is about 145 miles. The incorporators are Daniel Coghlin, Ira W. Dane, Ira T. Davis, T. W. Hendry, and S. C. Wheeler.

Savannah, Florida & Western.—The track on the Waycross & Florida, this company's new line to Jacksonville, has reached the St. Mary's River, about 40 miles from the main line at Waycross, Ga. The grading in Florida is nearly finished, and tracklaying is in progress from Jacksonville and also in both directions from Callahan, the crossing of the Transit road.

Southern Pacific.—Work on this road is progressing actively toward El Paso. Track is now laid for 63 miles eastward from last year's terminus at Deming, and but few miles remain to reach the town of El Paso.

Telegraph Consolidation.—The Union Trust Company has sent the following notice to the New York Stock Exchange:

"We are advised by counsel that the injunction in the matter of the Western Union Telegraph Company restrains us from issuing or delivering any stock except such as results from transfer from one person to another of stock of the Western Union Company already issued or delivered. We are, therefore, prevented at present from delivering Western Union stock or certificates of indebtedness in exchange for stock of the Atlantic & Pacific and the American Union Telegraph companies. In order to prevent inconvenience to those parties who have deposited stock of either the Atlantic & Pacific or American Union companies with us for exchange into Western Union stock, which exchange by reason of the injunction we have not

been able to complete, we are prepared to return stock so deposited to parties desiring it, and for such purpose will cancel in such cases the assignment executed to the Western Union Telegraph Company."

Texas, Topolovampo & Pacific.—This company has been organized under the general law of Massachusetts to build a railroad in Mexico, the route of which is described as follows: The main line is to run on the most feasible route from a point at or near Piedras Negras, on the right bank of the Rio Grande, in a southwesterly direction across the state of Coahuila, the district of the Botson de Mapimic, the state of Chihuahua, perhaps the state of Sonora, and the state of Sinaloa to the bay of Topolovampo, on the Gulf of California. The branches are to run on the north to a point near or at Presidio del Norte, on the right bank of the Rio Grande, and by Tepic and Guadalajara, to the city of Mexico and points south.

Toledo, Delphos & Burlington.—The agreement of consolidation with the Dayton & Southeastern fixes the capital stock of the consolidated company at \$7,000,000. It is to be issued share for share in place of the old stock of both companies.

Ulster & Delaware.—Work has been begun on a branch which is to leave this road at Phenicia, N. Y., and run through Stony Clove to Hunter, in Greene County, with a short branch to Tannersville, making 14 miles in all. The company hopes to have the road ready for use by July 1. It will afford a convenient means of access to the heart of the Catskill region, to which so many thousands resort every year, and which can now only be reached by a tedious stage ride.

Union Pacific.—It is said that this company is arranging to build the line to Oregon, which has been so long talked about. It will leave the main line at Granger, Wyo., and run to Port Neuf and by Wood River to Boise and Baker City, Idaho, and thence westward into Oregon.

It is also proposed this year to extend the Denver & South Park line from Leadville into the Gunnison country, and to build a new line from Greeley, Col., up the Cache-la-Poudre into the North Park. Nothing has been said about any more branches in Nebraska this year.

West Florida.—The Florida Legislature has passed the bill granting 20,000 acres of land per mile in aid of this road, to extend from the terminus of the Jacksonville, Pensacola & Mobile at the Chattahoochee River west to Pensacola, about 150 miles. The lands are to be taken from any state lands west of the Suwannee River, provided enough can be found there.

Wilmington & Northern.—A branch is to be built from this road in Wilmington, Del., to deep water near the mouth of the Christiana River, where the Duponts, who own a controlling interest in the road, are building a large wharf. A ferry will be run from this wharf across the Delaware to Pennsgrove, N. J., where it will connect with the Delaware River road, lately bought by the Duponts.

Yates & Steuben.—It is proposed to build a narrow-gauge road from Penn Yan, in Yates County, N. Y., south by west along the west side of Lake Keuka to Hammondsport, in Steuben County, connecting with the Bath & Hammondsport road. The road would be about 22 miles long.

ANNUAL REPORTS.

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Hannibal & St. Joseph.

This company owns and works a line from Hannibal, Mo., to St. Joseph, 206.41 miles; branches from St. Joseph to Atchison, Kan., 19.47 miles; Cameron, Mo., to Kansas City, 53.05 miles; Palmyra, Mo., to Quincy, 13.42 miles; a total of 292.35 miles. The report is for the year 1880, during which there was no change in mileage.

The equipment consists of 78 locomotives; 31 passenger, 3 reclining-chair, 3 mail, 2 baggage and mail and 10 baggage cars; 7 refrigerator, 569 box, 476 combination, 100 stock, 74 flat, 416 coal and 34 caboose cars; 1 directors', 1 pay, 1 derrick, 1 wrecking and 1 pile-driver car; 58 hand, 61 rubble and 6 velocipede hand cars.

The capital and general accounts are as follows:

Stock, common.....	\$9,168,700.00
Stock, preferred.....	5,083,024.00
Total stock (\$48,749 per mile).....	\$14,251,724.00
Bonds (\$29,529 per mile).....	8,633,000.00
Total.....	\$22,884,724.00
Road and equipment (\$40,924 per mile).....	\$13,718,241.45
Discount on securities, depreciation, etc.....	6,497,639.86
Total.....	20,215,881.31
Balance to general account.....	\$2,068,842.69
Balance from revenue account.....	336,549.30
Bills and accounts payable.....	133,227.57
Unclaimed coupons and dividends, January coupons, etc.....	334,029.50
General profit and loss.....	152,340.02
Total.....	\$3,028,980.08
Cash.....	\$535,002.11
Supplies.....	92,432.94
Bills and accounts receivable.....	148,270.19
Stocks, bonds, elevators, etc.....	101,863.68
Land grant bonds.....	143,000.00
Land Department.....	2,555,341.95
Balance of suspended and doubtful accounts.....	54,478.21
Total.....	3,628,980.08

The bonded debt remains unchanged; it consists of \$4,000,000 convertible bonds; \$3,000,000 Missouri state bonds; \$1,200,000 Kansas City & Cameron bonds and \$433,000 Quincy & Palmyra bonds. There are also \$307,

000 land income bonds, the principal and interest of which is entirely met from land sales. The yearly interest charge is \$654,640, or \$2,239 per mile.

The Land Department sold during the year 71,862.75 acres for \$551,774.09, an average of \$7.37 per acre. The cash receipts were \$342,193.44, of which the sum of \$268,050.40 was from lands or contracts assigned as security for the land income bonds. The total expenses of the Land Department were \$41,401.97, including taxes. The lands have all been examined and revalued during the year. Net proceeds from free lands paid to company were \$63,610.18. Sales from assigned lands go to the Trustee of the land income bonds.

The earnings for the year were as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Passengers.....	\$553,839.58	\$596,876.06	D. \$13,036.48	2.3
Freight.....	1,713,078.02	1,247,835.29	I. 465,242.73	37.2
Mail and express.....	77,509.45	78,813.17	D. 1,303.72	1.6
Miscellaneous.....	216,982.86	103,881.14	I. 113,081.72	108.8
Total.....	\$2,561,390.51	\$1,997,405.66	I. \$563,984.85	28.2
Expenses.....	1,304,590.08	1,223,421.97	I. 81,168.11	6.6
Net earnings.....	\$1,256,800.43	\$773,983.69	I. \$482,816.74	62.4
Gross earnings per mile.....	8,761.38	6,830.87	I. 1,930.51	28.2
Net earnings per mile.....	4,298.96	2,646.09	I. 1,652.87	62.4
Per cent. of exps.....	50.93	61.25	D. 10.32	

Passenger earnings suffered from the continued war on passenger rates. Freight earnings improved from increased traffic and better rates, and the general maintenance of pooling agreements at competing points. The expenses were somewhat increased by the very severe winter, which began as early as November.

The income account was as follows:

Earnings.....	\$2,561,390.51
Interest and exchange.....	6,354.24
Net proceeds sales of free lands.....	63,610.18
Total.....	\$2,631,354.93
Working expenses.....	\$1,304,590.08
Interest on bonds.....	654,040.00
Hire of cars.....	5,180.55
Dividends on preferred stock.....	330,395.00
Balance to general account.....	\$2,294,805.63

Dividends amounting to 6½ per cent. were paid on the preferred stock. There was expended on capital account the sum of \$142,417.78, whereof \$43,506.71 were for new freight cars and \$98,911.07 for new construction, including real estate, new sidings and fences, new buildings and increased cost of steel over iron rails.

The traffic for the year was as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Train miles.....	419,368	414,118	D. 5,250	0.9
Passenger.....	975,603	938,065	I. 37,538	4.0
Freight.....				
Car miles.....				
Passenger train cars.....	2,239,970	2,190,243	I. 49,727	2.3
Freight cars.....	16,864,202	15,715,882	I. 1,148,320	7.3
Passengers carried.....	324,220	282,379	I. 41,841	14.8
Passenger mileage.....	19,925,041	21,545,368	D. 1,620,327	7.5
Tons freight carried.....	716,730	622,553	I. 94,177	15.1
Tonnage mileage.....	120,067,740	111,087,174	I. 8,978,566	7.7
Av. train load.....				
Passengers, No.....	48.00	52.00	D. 4.00	7.7
Freight, tons.....	123.70	119.50	I. 4.20	3.5

The total locomotive mileage for 1880 was 1,995,739 miles; cost per mile 16.24 cents. Of the freight car mileage 77.8 per cent. was of loaded cars. The average load per loaded car was 9.19 tons; average load for all freight cars, 7.15 tons.

Of the passenger mileage 57.8 per cent., and of the tonnage mileage 73.9 per cent. were of through business. Leading items of freight were 182,693 tons grain and flour, 165,402 tons lumber, 112,244 tons coal and 78,480 tons live stock. The freight traffic was not unevenly divided, 47.6 per cent. being of east-bound and 52.4 per cent. of west-bound business in 1880.

The receipt per unit of traffic, and the cost per train and car mile were as follows, in cents:

	Passenger.		Freight.	
	1880.	1879.	1880.	1879.
Receipt per passenger or ton per mile.....	2.760	2.640	1.214	1.007
Cost per passenger or ton per mile.....	2.200	1.920	0.717	0.720
Net per passenger or ton per mile.....	0.560	0.720	0.497	0.287
Cost per train mile.....	107.040	100.010	88.690	86.270
Cost per car mile.....	19.610	18.910	5.180	5.150

The President's report says: "During the year 28 miles of track have been laid with steel, making an aggregate of 205 miles of steel rail track; 79,112 cross-ties have also been put in. The 3,000 tons of steel rails which it is intended to purchase during 1881 will leave no iron rails in the track between Quincy and Kansas City. A large amount of work has been done on the equipment in the way of rebuilding and improving it, in addition to keeping the current repairs up—all of which has been charged to operating expenses. One hundred new coal cars, having a capacity of 20 tons load, have also been built, and 100 additional grain cars of 33 ft. in length are in process of construction. The payments on the subscription for the bonds of the St. Louis, Keokuk & Northwestern Railway, referred to in last report, are completed, and we have received the bonds to the amount of \$35,500, which appear on the balance sheet at their cost. The land sales show very favorably, an active demand for land continues to exist, and payments on contracts now in force are made promptly."

"The contracts with the Missouri Pacific Railway Company for the use of the road between St. Joseph and Atchison, together with the terminal facilities at those places, and with the Chicago, Rock Island & Pacific Railway Company for hauling their freight between Cameron and St. Joseph, referred to in last year's report, have been executed and are in force. The second track at Kansas City between the bridge and Union Depot—the construction of which for joint use with the Chicago & Alton Railroad Company, heretofore referred to, has been completed and the rental to be paid to us by that company for its use, fixed by arbitration at \$9,500 per year. A contract is also in negotiation with the Union Pacific Railway Company for use by the St. Joseph & Western Branch of the yard and depot at St. Joseph. A union depot has been completed at Atchison, the stock, as in the case of the one at Kansas City, being owned in equal shares by the railroads in interest, your company having one-seventh. A union depot company, on a similar basis, is now organized for the erection of buildings at St. Joseph, and one is contemplated in Hannibal. The buildings at both places will probably be completed during 1881."

Union Pacific.

The reports of this company have heretofore covered only the Union Pacific proper, that is, the 1,047 miles from Council Bluffs to Ogden. The report published for 1880 includes

the whole consolidated road, the former Union Pacific and Kansas Pacific, with the several leased lines and branches worked, 3,131 miles at the close of the year. Comparisons with 1879 are made by adding together the earnings of the several lines under their separate managements for that year.

The general account, somewhat condensed, is as follows:

Stock.....	\$50,782,300
Bonds, less amount held by trustees.....	82,623,114
United States subsidy.....	45,673,488
Bills and accounts payable, January 1.....	\$6,347,967
Interest, etc.....	4,828,132
Less cash in hand.....	1,519,835
Interest accrued, not yet due.....	782,720
Income account, surplus.....	2,521,878
Income used for sinking funds.....	434,000
Land income.....	848,206
Total.....	\$185,165,541
Cost of road, etc., at consolidation.....	\$153,548,842
Additions since.....	1,194,788
Total cost.....	\$154,743,630
Bonds and stocks held.....	22,043,127
Land Department assets.....	6,384,181
Materials.....	1,877,290
Interest on U. S. bonds in excess of sinking fund.....	117,304
Total.....	185,165,541

The bonds consist of \$53,889,000 Union Pacific and \$39,095,624 Kansas Pacific, from which are deducted \$10,361,510 held by the trustees under the consolidated mortgage. The United States bond account shows \$27,236,512 issued to Union Pacific; \$6,303,000 to Kansas Pacific, and \$26,056,259 interest, less \$13,922,281 interest repaid by transportation, leaving a balance of \$45,673,488 as above. Bills and accounts payable include the January interest and dividends and the current pay-rolls and supply bills for December, which are paid during the following month.

The land assets include \$4,533,808 Union Pacific and \$1,850,373 Kansas Pacific. Stocks and bonds include \$349,582 of the company's own securities; the rest are shown by the statement below.

Statement of bonds and stocks of other companies owned by the Union Pacific Railway:

	Stocks.	Bonds.
Omaha & Republican Valley.....	\$788,000	\$1,572,000
Omaha, Nebraska & Black Hills.....	360,000	480,000
St. Joseph & Western.....	1,530,200	
St. Joseph & Pacific.....	1,330,544	756,220
Kansas & Nebraska.....		
St. Joseph & Western Receivers' certificates.....	113,000	
Marysville & Blue Valley.....	64,000	128,000
Colorado Central.....	3,939,200	2,439,000
Utah & Northern.....	4,012,000	4,012,000
Lawrence & Southwestern.....	240,000	240,000
Salina & Southwestern.....	226,700	228,000
Kansas Central.....	357,100	638,000
Central Branch Union Pacific.....	853,400	
St. Joseph Bridge Co.....	400,000	784,000
Utah Central.....	530,000	
Utah Southern.....	846,000	
Utah Southern Extension.....	650,000	975,000
Utah Western.....	600	16,000
Denver, South Park & Pacific.....	300,400	
Denver, So. Park & Pac. Con. & Land Co.....		
Walsh & Jordan Valley.....	12,000	10,000
St. Louis, Council Bluffs & Omaha.....		19,500
Hastings & Grand Island.....		375,000
Manhattan, Alma & Burlingame.....	319,000	638,000
Las Animas Bridge Co.....	1,500	
Union Depot Co., Kansas City.....	1,000	
Occidental & Oriental Steamship Co.....	150,000	
Topoka Iron Co.....	5,000	
Grand Island precinct bonds.....		25,000
Bakerville & Leadville Toll Road Co.....	32,000	
St. Joseph Union Depot.....	1,000	
Atchison, Colorado & Pacific.....		110,000
Manhattan & Blue Valley.....	500,000	
Echo & Park City.....	280,000	420,000
Kansas & Missouri Bridge Co.....	9,911	
Col. Cent., Julesburg Extension.....	1,125,000	
Total cost \$19,507,615.....	\$17,608,011	\$16,304,234

Securities held by trustees of consolidated mortgage bonds:

	Stocks.	Bonds.
Junction City & Fort Kearney.....	\$720,000	\$970,000
Denver & Boulder Valley.....		528,000
Solomon.....	2,001,000	575,000
Golden, Boulder & Caribou.....	70,000	60,000
National Land Co.....	94,800	
Total, charged at \$2,185,950.....	\$2,875,800	\$2,133,000

It will be seen that nearly all the securities held are of leased or controlled lines. Those held by the trustees are pledged as part of the security under the consolidated mortgage.

The earnings for the year were as follows:

	1880.	1879.	Increase.	P. c.
Passengers.....	\$5,171,115	\$4,236,870	\$934,245	22.0
Government troops.....	234,010	169,928	64,082	37.7
Freight, cash.....	13,406,910	10,572,805	2,834,105	26.7
gov't.....	469,025	443,435	25,590	5.8
Co.'s.....	1,342,572	1,051,155	291,417	27.7
Mail.....	719,350	685,713	33,637	4.9
Express.....	681,818	496,218	185,600	37.8
Miscellaneous.....	430,334	384,142	46,192	12.1
Total.....	\$22,455,134	\$18,040,206	\$4,414,888	24.5
Expenses.....	10,545,119	8,368,837	2,176,282	25.9
Net earnings.....	\$11,910,015	\$9,671,420	\$2,238,595	23.2
Per cent. of expenses.....	46.96	46.38	0.58	

The income account was as follows:

Net earnings.....	\$11,910,015
Interest and dividends received.....	1,010,152
Premium, profit on investments sold, etc.....	284,249
Total.....	\$13,204,416
Interest on bonds.....	\$5,174,474
Discount, interest and exchange.....	114,315
Sinking fund requirements.....	434,000
Due the United States on business of the year.....	1,779,811
Dividends, 6 per cent.....	3,045,738
Balance to account of 1881.....	\$2,656,078

The net receipts from the land grant for the year were \$957,518.40, of which \$669,346.94 were from Union Pacific grant, \$268,417.32 from Kansas Pacific grant and \$19,754.43 from other lands. The total amount of land sold was 276,533 acres. The land accounts were not consolidated until Feb. 1; the net receipts from that date to Dec. 31, eleven months, were \$249,206.

There were \$228,000 land-grant bonds canceled during the year, leaving \$6,071,000 outstanding. To meet these there are on hand \$4,533,745.46 in cash and land contracts, besides the unsold lands.

Wabash, St. Louis & Pacific.

The following statements from President Humphrey's report are published in advance of the full report: Since the consolidation the company has acquired by purchase

and lease the following roads: The Chicago & Paducah, acquired April 1, and the Chicago & Strawn, Aug. 1, 1864.8 miles; the Quincy, Missouri & Pacific, July 1, 105.2 miles; the Champaign, Havana & Western, Aug. 2, 131 miles; the Missouri, Iowa & Nebraska, Oct. 1, 148 miles; the Toledo, Peoria & Western, Oct. 1, 246.1 miles; Centreville, Moravia & Albia, 26 miles; total, 921.1, comprising with the original lines of the Wabash and the St. Louis, Kansas City & Northern railways an aggregate length of 2,479 miles.

The earnings, etc., for 1880 were as follows:

Earnings for the year.....	\$12,428,111.72
Add received for rent of tracks, etc.....	33,601.38
Total.....	\$12,461,713.10
Operating expenses.....	7,787,348.50
Net.....	\$4,674,364.60

Appropriated as follows:

Interest.....	\$2,657,359.01
Rentals.....	483,255.63
Taxes, rent of cars and miscellaneous.....	514,568.88
Total.....	3,655,184.42

Leaving surplus for the year over fixed charges..... \$1,019,180.18

From the surplus a quarterly dividend of 1½ per cent. was declared upon the preferred stock, payable Feb. 10, 1881.

The operating expenses, which have been about 62 per cent. will be materially reduced, as the extensions reach and the traffic passes over the main line.

Central Iowa.

This company, successor to the Central, of Iowa, through foreclosure, owns a line from Albia, Ia., north to Northwood, 189½ miles, with the Muchachinock Branch, 1½ miles, making 191 miles in all. The following brief statement for the year 1880 is published.

The earnings and expenses were as follows:

	1880.	1879.	Increase.	P. c.
Gross earnings.....	\$962,074.16	\$782,446.01	\$179,628.15	23.0
Expenses.....	620,776.96	546,646.00	74,130.96	13.6
Net earnings.....	\$341,297.20	\$235,800.01	\$105,497.19	44.7
Gross earnings per mile.....	5,037.03	4,096.58	940.45	23.0
Net.....	1,786.90	1,234.56	552.34	44.7
Per cent. of exps.....	64.32	69.86		

The business of the road increased largely, the coal business furnishing the largest part of the growth of traffic. There were 2,500 tons of steel rails used in renewals and an equal amount has been ordered for the current year.

All expenditures were charged to operating expenses as above, which, included last year the sum of \$156,969 for renewals and improvement of roadway, and \$128,203 for construction and equipment. The company has no floating debt.

Knox & Lincoln.

This company owns a line from Bath, Me., to Rockland, 49 miles. The statements below are from the report presented at the recent annual meeting for the year 1880.

The road was built chiefly from the proceeds of bonds issued by the towns through which it passes. Of these town bonds there were outstanding on Dec. 31 last \$2,335,750. On these bonds interest was paid by the several towns amounting to \$59,250. The sum of \$4,250 remained unpaid, the town of Wiscasset having defaulted on its bonds.

The earnings of the road for the year were as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Passengers.....	\$67,279.57	\$60,312.91	I. \$6,966.66	11.5
Freight.....	46,294.99	32,866.43	I. 13,428.56	40.8
Other.....	10,010.10	11,187.58	D. 1,177.48	10.5
Total.....	\$123,584.66	\$104,366.92	I. \$19,217.74	18.5
Expenses.....	74,480.73	57,066.07	I. 17,414.66	30.6
Net earnings.....	\$49,103.93	\$47,300.85	I. 1,803.08	1.8
Gross earnings per mile.....	2,522.14	2,129.94	I. 392.20	18.5
Net.....	1,002.14	965.32	I. 36.82	1.8
Per cent. of exps.....	60.26	54.66	I. 5.60	

The directors account for \$9,182.38 of the increase in operating expenses by the cost of a permanent embankment in place of the Dunton pile bridge, leaving \$8,231.28 increase of ordinary operating expenses in 1880 over those of 1879. The number of passengers carried in 1880 was 69,977, an increase of 10,252 over the number in 1879. The rolling stock is reported in good condition, the number of locomotives and cars of various kinds remaining the same as a year ago, one snow plough only having been added.

Consolidation Coal Co.

This company owns and works a large coal property in the Cumberland region and also the Cumberland & Pennsylvania Railroad, consisting of the main line from Cumberland to Piedmont, 38 miles; the Eckhart Division, 14 miles, and the Cumberland Branch, 3 miles, making 55 miles of road in all. The report is for the year 1880, but the mining and transportation accounts are not kept separately.

The total amount of coal mined and shipped from the company's mines was 568,244 tons, against 438,693 tons in 1879, an increase last year of 84,552 tons, or 17.5 per cent.

The income and profit and loss accounts for the year were as follows:

Receipts from mines, railroad, rents, etc., including value of coal on hand.....	\$2,265,639
Expenses of working and renewals.....	1,771,516
Net earnings.....	\$494,123
Interest on funded debt.....	\$156,900
Sinking fund.....	61,514
Total.....	\$275,709

Surplus for the year..... \$275,700

Balance of profit and loss, Dec. 31, 1879..... \$7,633

Total..... \$283,342

Deficit remaining from 1879..... \$19,794

Dividend for 1880, paid Jan. 27, 1881..... 256,250

Balance of profit and loss, Dec. 31, 1880..... \$7,298

The company also holds as a cash